

## THE GROUND BEETLE (COLEOPTERA: CARABIDAE) FAUNA OF MAINE, USA

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### ABSTRACT

A survey of the modern carabid fauna of Maine has shown that the fauna consists of 425 documented species, 14 more than previously documented for the Maine fauna in the latest catalog for the family in North America or in the most recent checklist on the state beetle fauna. **New state records** are *Agonum cupreum* Dejean, *Amara anthobia* Villa and *Villa*, *Anisodactylus laetus* Dejean, *Bembidion intermedium* Kirby, *Bembidion sejunctum sejunctum* Casey, *Brachinus vulcanoides* Erwin, *Diplocheila impressicollis* Dejean, *Elaphropus dolosus* LeConte, *Lebia grandis* Hentz, *Myas coracinus* Say, *Olisthopus micans* LeConte, *Panagaeus fasciatus* Say, *Pentagonica picticornis* Bates, and *Tachyta parvicornis* Notman. The record for *B. sejunctum sejunctum* is the first for the species in the eastern United States. A recent record for *Omophron labiatum* (F.) in the state could not be substantiated by any specimen. Notes on biology are presented for species for which that knowledge exists. Distributions are presented for all taxa based on standard biophysical regions for the state and the knowledge of those distributions; distribution maps are presented for all species for which township records are known and for which we have specimen records in our database. Work on better defining the current distributional limits is ongoing. Several adventive European taxa have already exhibited very rapid dispersal across the state.

Key Words: biodiversity, Nearctic, distribution, biology, maps

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Knowledge of the distribution of organisms on Earth is intrinsically important to understanding the total biosphere, its functions, and its potential interactions with the climatic and human environment. Knowledge of the insect fauna in particular is important, as insects and birds are the two major groups of organisms in which most species are capable of flight, and thus sufficiently mobile to be able to respond rapidly to environmental change. The ecological habits of many insects are also not at all understood, yet they play pivotal roles in ecosystem nutrient cycling or other critical functions. Recent episodes of parasitism by native flies

on European honeybees in California (Core *et al.* 2012), for example, are helping to focus attention on the roles of native pollinators – long ignored by most, even in the entomological communities.

The family Carabidae among the beetles is one of the largest in the world, with approximately 33,905 described species thus far, including Cicindelini (Bousquet 2012), with 2,635 species-group taxa reported from North America north of Mexico by Bousquet and Laroche (1993). Bousquet (2012), however, estimated that the true number of North American carabid species-group taxa would eventually number about

2,560 (2,676 including all Geadephaga), given assumptions about the potential synonymization of numerous Casey species with future revisions of various groups.

Lindroth (1961–1969b) provided the first major review of North American Carabidae across all species, though his studies addressed only the Canadian-Alaskan fauna and excluded the Cicindelini. Nonetheless, most of the species in the Maine fauna were included in this valuable major work. Although they clearly stated that it was not to be considered a state list, the annotated catalogue of the Maine Forest Service (MFS) collection by Dearborn and Donahue (1993) was apparently the first systematic list of the carabid fauna of Maine and included some 145 species that could be found in the state collection (including Cicindelidae, which they listed as a separate family). Bousquet and Laroche (1993) listed 343 species in the state fauna in their catalogue of the family for all of North America, which Bousquet (2010) subsequently expanded to 393 species and then (Bousquet 2012) to 411 species by accepting the additions contributed by Majka *et al.* (2011) in their valuable synthesis of the entire Maine beetle fauna.

This rich diversity is made possible by habitat and/or food preference specializations among many taxa, allowing closely related species to occupy numerous discrete microhabitats within a small area. It is this habitat specialization that makes their potential as environmental indicators so significant.

Geographically, Maine is also particularly well situated as a potential biothermometer of the impacts of regional environmental change. Situated in the northeastern corner of the USA, the state borders only one other US state (New Hampshire, to the west) but two Canadian provinces to the north (Québec and New Brunswick). Since this location also lies in the ecotonal boundary between the boreal conifer forest and the eastern hardwood forest of North America, many eastern North American species reach their northern or southern distributional limits within the state.

Knowledge of current distributions of native species is also critical for understanding future changes in their distributions due to climate change. This is also particularly important with regards to documenting rates of spread for adventive taxa that have readily become established in the state (*e.g.*, *Harpalus rufipes* (DeGeer) and *Harpalus rubripes* (Duftschmid)).

A warming climate may also result in northward spread of taxa previously restricted to more southern latitudes, as has already been documented for deer ticks in Maine (Lubelczyk

2008) and butterflies in Massachusetts (Breed *et al.* 2013). Exploration of previously ignored or insufficiently sampled microhabitats can also yield new species to the list, as was found with the discovery of the previously unknown species *Platynus indecentis* by Liebherr and Will (1996).

Major recent works (Laroche and Larivière 1990; Bousquet 2010, 2012; Majka *et al.* 2011) have documented well the overall carabid fauna of the state, though detailed distributions within the state have not been attempted previously; for many species, the numbers of specimens known are too few to allow definitive statements to be made of where a species is or is not to be found. It should be noted that Bousquet (2010, 2012) listed a number of species for the state for which we have been unable to locate specimens, but which presumably are present in more recent additions to the Canadian National Collection in Ottawa than were there when we conducted our survey of their holdings. Majka *et al.* (2011) accepted all of Bousquet's (2010) records and added 36 new records to the known state fauna.

This project was undertaken in 1995 as a companion study to a survey of the Vermont and New Hampshire carabid faunas undertaken by Ross and Joyce Bell, similar to the way in which Chris Majka and colleagues (Majka 2005; Majka *et al.* 2006, 2007, 2008; Majka and Bousquet 2008; Majka and Gilhen 2008; Majka and Vickery 2008; Webster and Bousquet 2008; Webster and DeMerchant 2012) Majka *et al.* 2006, 2007, 2008 have been very efficiently and effectively clarifying our knowledge of the carabid fauna of the adjacent Maritime Provinces of Canada. Our long-term goals are to document as thoroughly as possible what is known of the modern carabid beetle fauna of the state of Maine, based on actual specimens (or recent highly reliable literature sources) and to be able to delimit the range of each of these species, in a manner comparable to that achieved by Laroche (1975) for the carabid fauna of Québec and Labrador. Thus, our study will complement that of Krinsky and Oliver (2001) for Connecticut and that of Sikes (2004) for Rhode Island; when the Vermont-New Hampshire fauna is published, only Massachusetts will remain without its own statewide carabid survey among the New England states.

This paper represents a preliminary report on that study, based on a total of over 5,400 individual species records (= species × townships of record) for the state as a whole. Work is continuing and the long-term plan is to produce a more comprehensive report when we believe the overall fauna is much better understood. This current work is intended as a status report on the

results of the first decade of study undertaken. Specimen data are complete as of the year 2000, and thus must be seen as a “snapshot”; of what was known of the fauna at that time, although recent literature records of major significance (Maddison 2008; Ward and Mays 2010) have also been included. Although work is continuing by several workers on Maine specimens, revisiting all collections to include newer records, however, was not feasible. Undoubtedly, much remains to be found and documented.

Some recent taxonomic changes have, for practical reasons, not been incorporated in our paper. These include the return of *Acalathus advena* (LeConte) to the genus *Calathus* Stephens, the transfer of *Cicindela marginata* (F.) to the genus *Ellipsoptera* Dokhturow, the transfer of *Stenolophus conjunctus* (Say) and *Stenolophus rotundicollis* (Haldeman) to the genus *Agonoleptus* Casey, and the return of *Paratachys* Casey to a subgenus of *Tachys* Melsheimer (as per Bousquet 2012). Higher classification changes that could be accommodated have been accepted. However, we feel that retaining older identifications of these taxa will minimally detract from the usefulness of our study, if at all.

#### MATERIAL AND METHODS

The vast majority of records included in this study are based on specimens in existing regional collections, with records through 2000. Records from major regional collections and several private collections are included, as well as a very small number of more recent specimen records that have been included for particularly noteworthy taxa.

Collections from which data have been included in this study include:

CNC	Canadian National Collection of Insects, Arachnids, and Nematodes
MCZ	Museum of Comparative Zoology at Harvard University
MFS	Maine Forest Service
MIFW	Maine Department of Inland Fisheries and Wildlife
PROC	Procter Collection, Acadia National Park
PVT	Private collections for which the owners preferred to remain anonymous
RENC	Robert E. Nelson Collection
RPWC	Reginald P. Webster Collection
UCD	University of California at Davis (1 specimen only)
UNH	University of New Hampshire
UVM	University of Vermont

Literature records were carefully selected to include only those with the most trustworthy of

documentation, including Bousquet (2012) and Majka *et al.* (2011). Locality records in recent taxonomic revisions of *Harpalus* Latreille (Noonan 1991), *Anisodactylus* Dejean (Noonan 1996), and *Pseudoperlyphus* Hatch (Maddison, 2008) were accepted, as were records from the recent synthesis on Cicindelinae (Leonard and Bell 1999) and the intensive early faunal surveys of Mount Desert Island (Procter 1946), with the taxonomy of this last source brought into conformity with modern usage. The Procter Collection is currently housed at Acadia National Park in Bar Harbor, Maine, with annual additions to the fauna being made through Entomological BioBlitzes usually focused on individual orders (Chandler *et al.* 2012; [www.nps.gov/acad/naturescience/bioblitz.htm](http://www.nps.gov/acad/naturescience/bioblitz.htm)).

Older specimens in museum collections rarely have specific collecting technique data, but those collected specifically for this study have been found by numerous techniques, including visual collecting of specimens active by day and by discovering the hiding places of nocturnal taxa, by turning over rocks, logs, and debris, by lifting bark from fallen logs, by pitfall and open pan trapping, marsh and bog treading, incandescent and blacklight traps, sifting through litter and decaying organic matter, as well as by flight-intercept, Malaise, and sticky traps, and Berlese funnel extractions. Identifications of specimens collected for this study were based on published literature (Lindroth 1961–1969b) and comparisons with authoritatively identified specimens. Taxonomy has been brought into accord with the latest revisions (Bousquet and Laroche 1993; Bousquet 2010, 2012). Most species in our database can be identified using keys in Bousquet (2010), although four species (*Acupalpus indistinctus* Dejean, *Amara anthobia* Villa and Villa, *Anisodactylus laetus* Dejean, and *Tachyta parvicornis* Notman) were previously unknown in the region and thus are not represented in Bousquet’s key.

For species readily identified visually that were encountered in ecologically sensitive areas (*e.g.*, tiger beetles in state or national parks or nature preserves), reasonable and reliable sight records were also accepted; however, only a very small handful of these records were included in our database. Records were entered into a computerized database compatible with the Maine state collections integrated database and based on species records per individual township (Figs. 1, 2). Multiple specimens of a single species from a single township, even if collected by multiple collectors, were counted as a single record.

What is known of the Maine and general geographic range of taxa, their biology, flight dynamics, and habitat preferences are

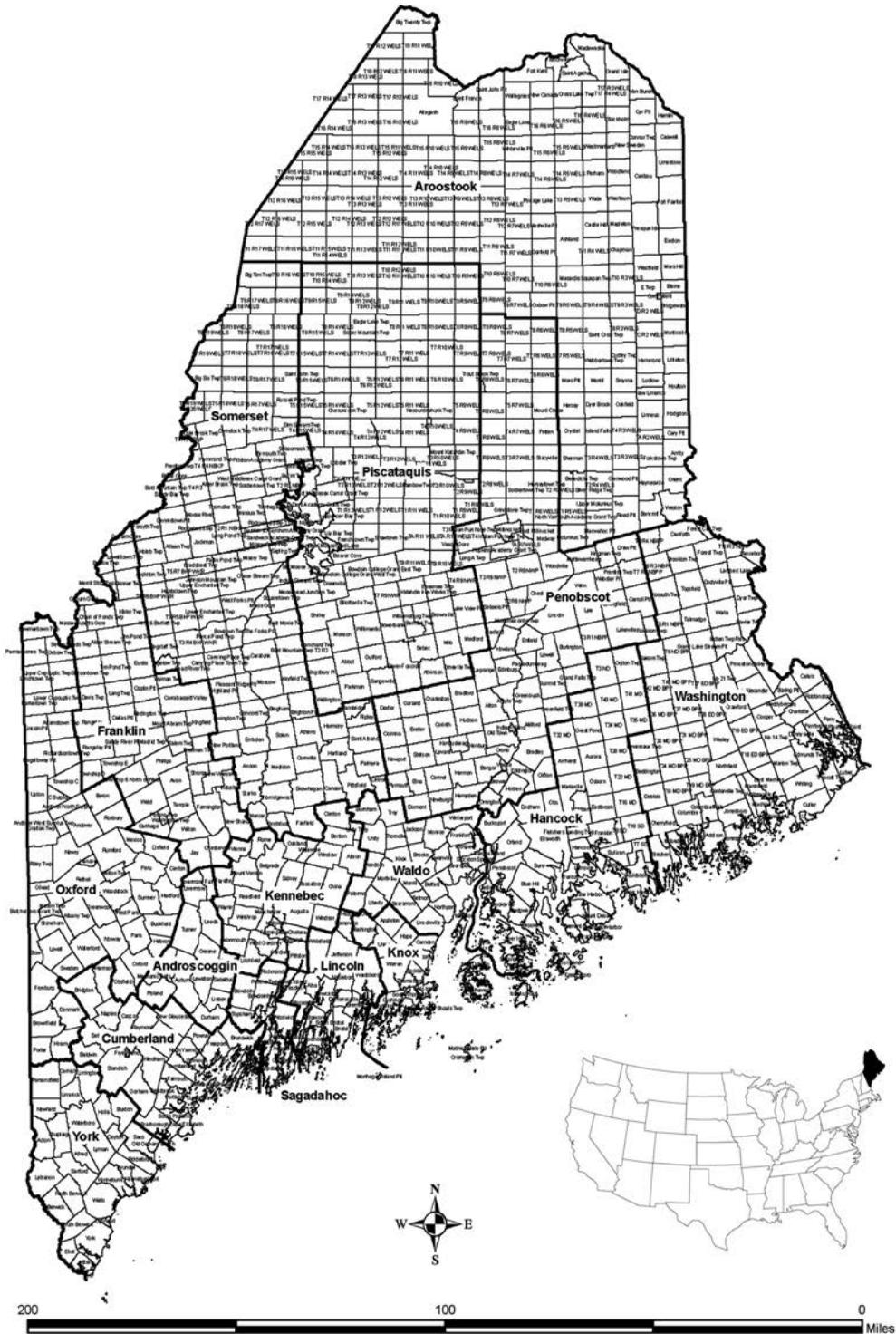


Fig. 1. Map of Maine showing all counties and townships of the state, as used in this study; inset shows location of Maine within the USA.

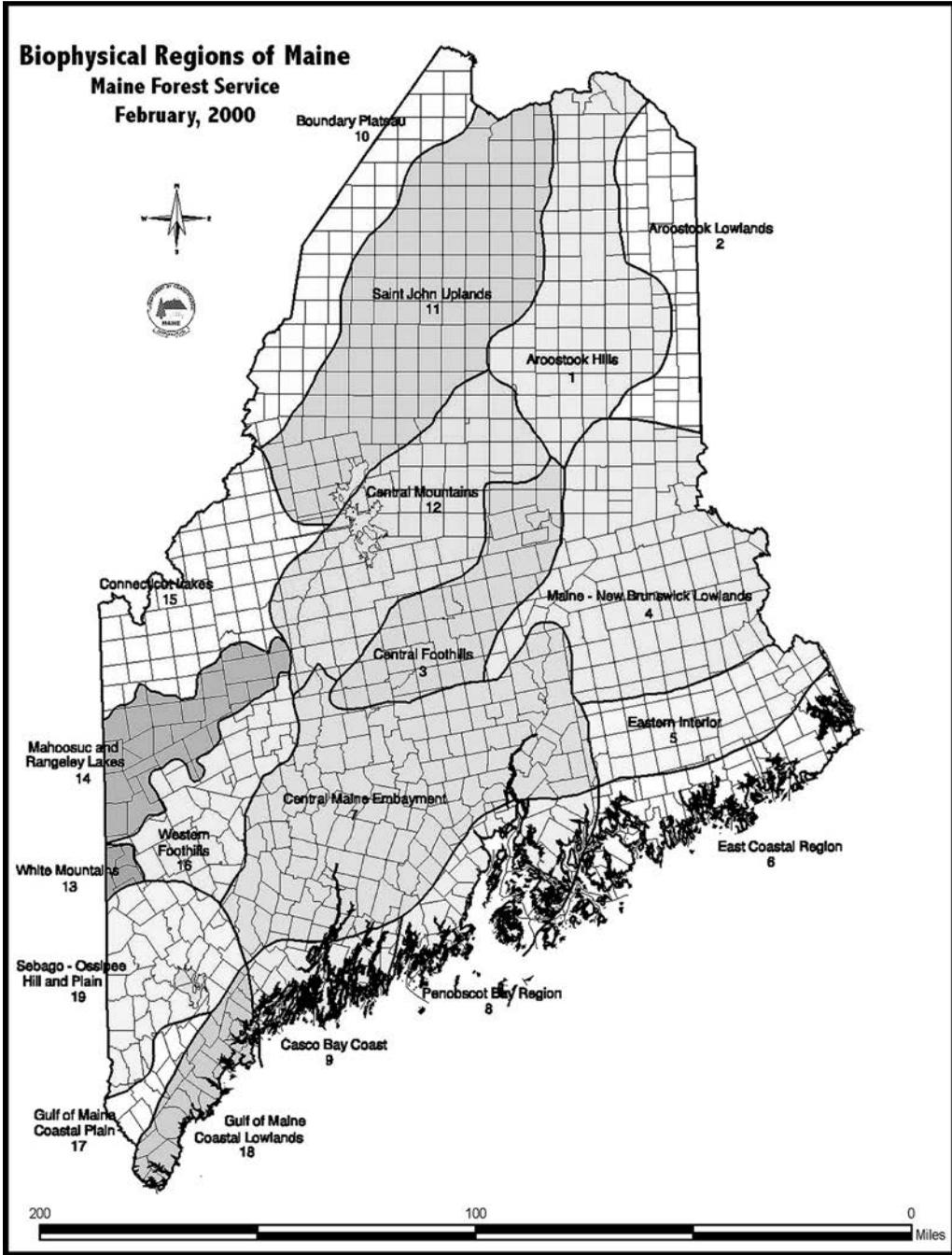


Fig. 2. Map of Maine showing biophysical regions of the state, as defined by the Maine Forest Service.

covered species by species (Appendix 1). Township records in a Microsoft Excel database were used to generate statewide distribution maps in which the townships recorded for a

given species were blackened (Plates 1–46). Species listed in Bousquet and Laroche (1993), Bousquet (2010, 2012) and Majka *et al.* (2011) for which there are state records only,

with no precise locality data, are excluded from the maps.

## RESULTS

A total of 5,420 individual records comprise the basis for this study, representing records from 474, or about 52%, of the 911 townships in Maine; 48% of the townships in the state are thus not represented by a single specimen, and many more are represented by five or fewer species. Only 11 townships (Bar Harbor, Belgrade, Fairfield, Lebanon, Lewiston, Mt. Desert, Mt. Vernon, Norridgewock, Orono, Sidney, and Waterville) have been so intensively collected that they are represented by more than 50 species in the database; of these, the seven townships of Belgrade, Fairfield, Lewiston, Mt. Vernon, Norridgewock, Sidney, and Waterville are clustered near the central part of the state. Clearly, data are currently insufficient to justify an attempt to map precise statewide distribution limits for most taxa.

However, all the biophysical regions of the state (Fig. 2) have been sampled. Not surprisingly, the best-known is the Central Maine Embayment biophysical region, which includes seven of the 11 best-studied townships. Surprisingly, the state's largest city (Portland) is barely represented in the database.

Our database contained locality and specimen records for 402 species; the checklists of Majka *et al.* (2011) and Bousquet (2012) contained records for 23 additional species which should also be considered part of our fauna: *Acupalpus nanellus* Casey, *Acupalpus testaceus* Dejean, *Agonum decorum* (Say), *Agonum nutans* (Say), *Amara crassispina* LeConte, *Amara neoscotica* Casey, *Bembidion impotens* Casey, *Bembidion levigatum* Say, *Bradycellus tantillus* (Dejean), *Calathus opaculus* LeConte, *Calosoma scrutator* (F.), *Elaphropus xanthopus* (Dejean), *Elaphrus fuliginosus* Say, *Harpalus megacephalus* LeConte, *Lebia lobulata* LeConte, *Miscodera arctica* (Paykull), *Nebria suturalis* LeConte, *Notiobia nitidipennis* (LeConte), *Notiophilus borealis* Harris, *Paratachys proximus* (Say), *Patrobis foveocollis* (Eschscholtz), *Schizogenius ferrugineus* Putzeys, and *Selenophorus ellipticus* Dejean. The record for *Omophron labiatum* (F.) in Majka *et al.* (2011) was based on a database error.

In this work, we document records for 14 additional species to the 411 documented in Majka *et al.* (2011) and Bousquet (2012), bringing the total known Maine carabid fauna to 425 species. Table 1 lists the known fauna, with our records compared to the species lists of Bousquet (2012) and Majka *et al.* (2011). These new records are *Agonum cupreum* Dejean, *A. anthobia*, *A. laetus*,

*Bembidion intermedium* Kirby, *B. sejunctum sejunctum* Casey, *Brachinus vulcanoides* Erwin, *Diplocheila impressicollis* Dejean, *Elaphropus dolosus* LeConte, *Lebia grandis* Hentz, *Myas coracinus* Say, *Olisthopus micans* LeConte, *Panagaeus fasciatus* Say, *Pentagonica picticornis* Bates, and *T. parvicornis*.

Very likely, there are more species in the state that have not yet been documented. This is a reflection of the generally poor record of collecting and documentation in the state compared to other areas in the region. Maine was a blank in distribution maps of many species prior to 1980, other than for high alpine taxa collected in the summit area of Mount Katahdin or species from Mount Desert Island studied by Procter and colleagues (Procter 1946).

## DISCUSSION

The total number of species of Carabidae represented in our database is 402. Bousquet (2010) listed 364 species for the state, adding 21 new records to the 343 documented earlier (Bousquet and Laroche, 1993). Majka *et al.* (2011) expanded this list to 411 species of Carabidae from Maine, now all accepted in the more recent Bousquet (2012) compendium.

Fourteen species in our database represent new state records not previously documented in either Bousquet (2012) or Majka *et al.* (2011); four species in our database (*A. indistinctus*, *A. anthobia*, *A. laetus* and *T. parvicornis*) are not listed at all in Bousquet's (2010) catalog and keys to the Northeastern North American fauna, and thus would not be identifiable using his keys, which are otherwise outstanding. One species, the coastal *B. sejunctum sejunctum*, represents the first eastern US record of a species otherwise restricted to Maritime Canada in the eastern part of the continent.

Some of the taxa identified that represent new additions to the known Maine fauna are particularly significant. *Harpalus rubripes* is a recent adventive European introduction, first collected in southern New Hampshire in 1981 (Bell and Davidson 1987). By 1986, records in our database show that the species was already in Waterville (Kennebec County) in central Maine, and by 1996 it had reached the easternmost county in the state, adjacent to the New Brunswick border. Majka *et al.* (2007), Webster and Bousquet (2008), and Bousquet (2010, 2012) have now documented the widespread presence of the species from the Canadian side of the border, in Québec as well as the Maritime provinces of New Brunswick, Nova Scotia, and Prince Edward Island. This is even more rapid than the rate of spread for the

**Table 1.** Checklist of the known Carabidae of Maine, showing species documented in this study compared to the faunal lists of Bousquet (2012) and Majka *et al.* (2011). Species are arranged taxonomically to the generic level, then alphabetically within each genus. Subtribe names are flush right in the “Tribe” column.

Subfamily	Tribe	Genus	Species	This study	Bousquet 2012	Majka <i>et al.</i> 2011		
Nebriinae	Nebriini	<i>Nebria</i>	<i>gyllenhali castanipes</i>	X	X	X		
		<i>Nebria</i>	<i>lacustris lacustris</i>	X	X	X		
		<i>Nebria</i>	<i>ivalis gaspesiana</i>	X	X	X		
		<i>Nebria</i>	<i>pallipes</i>	X	X	X		
		<i>Nebria</i>	<i>suturalis</i>	-	X	X		
	Notiophilini	<i>Notiophilus</i>	<i>aeneus</i>	X	X	X		
		<i>Notiophilus</i>	<i>aquaticus</i>	X	X	X		
		<i>Notiophilus</i>	<i>biguttatus</i>	X	X	X		
		<i>Notiophilus</i>	<i>borealis</i>	-	X	X		
		<i>Notiophilus</i>	<i>nemorialis</i>	X	X	X		
		<i>Notiophilus</i>	<i>novemstriatus</i>	X	X	X		
	Carabinae	Cychrini	<i>Scaphinotus</i>	<i>bilobus</i>	X	X	X	
			<i>Scaphinotus</i>	<i>viduus</i>	X	X	X	
			<i>Sphaeroderus</i>	<i>canadensis canadensis</i>	X	X	X	
<i>Sphaeroderus</i>			<i>nitidicollis brevoortii</i>	X	X	X		
<i>Sphaeroderus</i>			<i>stenostomus lecontei</i>	X	X	X		
Carabini		<i>Calosoma</i>	<i>calidum</i>	X	X	X		
		<i>Calosoma</i>	<i>frigidum</i>	X	X	X		
		<i>Calosoma</i>	<i>scrutator</i>	-	X	X		
		<i>Calosoma</i>	<i>sycophanta</i>	X	X	X		
		<i>Carabus</i>	<i>auratus</i>	X	X	X		
		<i>Carabus</i>	<i>chamissonis</i>	X	X	X		
		<i>Carabus</i>	<i>goryi</i>	X	X	X		
		<i>Carabus</i>	<i>maeander</i>	X	X	X		
		<i>Carabus</i>	<i>nemorialis</i>	X	X	X		
		<i>Carabus</i>	<i>serratus</i>	X	X	X		
		<i>Carabus</i>	<i>sylvosus</i>	X	X	X		
		Cicindelinae	Cicindelini	<i>Cicindela</i>	<i>ancocisconensis</i>	X	X	X
				<i>Cicindela</i>	<i>duodecimguttata</i>	X	X	X
				<i>Cicindela</i>	<i>formosa generosa</i>	X	X	X
<i>Cicindela</i>	<i>hirticollis rhodensis</i>			X	X	X		
<i>Cicindela</i>	<i>limbalis</i>			X	X	X		
<i>Cicindela</i>	<i>longilabris longilabris</i>			X	X	X		
<i>Cicindela</i>	<i>marginata</i>			X	X	X		
<i>Cicindela</i>	<i>marginipennis</i>			X	X	X		
<i>Cicindela</i>	<i>punctulata punctulata</i>			X	X	X		
<i>Cicindela</i>	<i>purpurea purpurea</i>			X	X	X		
<i>Cicindela</i>	<i>repanda repanda</i>			X	X	X		
<i>Cicindela</i>	<i>scutellaris lecontei</i>			X	X	X		
<i>Cicindela</i>	<i>sexguttata sexguttata</i>			X	X	X		
<i>Cicindela</i>	<i>tranquebarica tranquebarica</i>			X	X	X		
Loricarinae	Loricerini	<i>Loricera</i>	<i>pilicornis pilicornis</i>	X	X	X		
Elaphrinae	Elaphrini	<i>Blethisa</i>	<i>julii</i>	X	X	X		
		<i>Blethisa</i>	<i>multipunctata hudsonica</i>	X	X	X		
		<i>Blethisa</i>	<i>quadricollis</i>	X	X	X		
		<i>Elaphrus</i>	<i>americanus</i>	X	X	X		
		<i>Elaphrus</i>	<i>californicus</i>	X	X	X		
		<i>Elaphrus</i>	<i>cicatricosis</i>	X	X	X		
		<i>Elaphrus</i>	<i>clairvillei</i>	X	X	X		
		<i>Elaphrus</i>	<i>fuliginosus</i>	-	X	X		
		<i>Elaphrus</i>	<i>olivaceus</i>	X	X	X		
		<i>Elaphrus</i>	<i>ruscarius</i>	X	X	X		
Omophroninae	Omophronini	<i>Omophron</i>	<i>americanum</i>	X	X	X		
		<i>Omophron</i>	<i>labiatum</i>	-	X	X		
		<i>Omophron</i>	<i>tessellatum</i>	X	X	X		

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Table 1. Continued.

Subfamily	Tribe	Genus	Species	This study	Bousquet 2012	Majka et al. 2011
Scaritinae	Clivinini	<i>Clivina</i>	<i>americana</i>	X	X	X
		<i>Clivina</i>	<i>collaris</i>	X	X	X
		<i>Clivina</i>	<i>fossor</i>	X	X	X
		<i>Clivina</i>	<i>impressefrons</i>	X	X	X
		<i>Clivina</i>	<i>pallida</i>	X	X	X
		<i>Schizogenius</i>	<i>amphibius</i>	X	X	X
		<i>Schizogenius</i>	<i>ferrugineus</i>	-	X	X
		<i>Schizogenius</i>	<i>lineolatus</i>	X	X	X
		<i>Schizogenius</i>	<i>sulcifrons</i>	X	X	X
		<i>Dyschirius</i>	<i>affinis</i>	X	X	X
		<i>Dyschirius</i>	<i>curvispinus</i>	X	X	X
		<i>Dyschirius</i>	<i>dejeanii</i>	X	X	X
		<i>Dyschirius</i>	<i>erythrocerus</i>	X	X	X
		<i>Dyschirius</i>	<i>globulosus</i>	X	X	X
		<i>Dyschirius</i>	<i>pilosus</i>	X	X	X
		<i>Dyschirius</i>	<i>politus</i>	X	X	X
		<i>Dyschirius</i>	<i>setosus</i>	X	X	X
		<i>Dyschirius</i>	<i>sphaericollis</i>	X	X	X
		<i>Dyschirius</i>	<i>sublaevis</i>	X	X	X
		Broscinae	Broscini	<i>Miscodera</i>	<i>artica</i>	-
Trechinae	<i>Trechus</i>		<i>apicalis</i>	X	X	X
	<i>Trechus</i>	<i>crassiscapus</i>	X	X	X	
	<i>Trechus</i>	<i>rubens</i>	X	X	X	
	<i>Blemus</i>	<i>discus</i>	X	X	X	
	Bembidiinae	Bembidiini	<i>Asaphidion</i>	<i>curtum</i>	X	X
<i>Bembidion</i>			<i>americanum</i>	X	X	X
<i>Bembidion</i>			<i>antiquum</i>	X	X	X
<i>Bembidion</i>			<i>basicorne</i>	X	X	X
<i>Bembidion</i>			<i>bellorum</i>	X	X	X
<i>Bembidion</i>			<i>bruxellense</i>	X	X	X
<i>Bembidion</i>			<i>carinula</i>	X	X	X
<i>Bembidion</i>			<i>carolinense</i>	X	X	X
<i>Bembidion</i>			<i>castor</i>	X	X	X
<i>Bembidion</i>			<i>chalceum</i>	X	X	X
<i>Bembidion</i>			<i>concretum</i>	X	X	X
<i>Bembidion</i>			<i>confusum</i>	X	X	X
<i>Bembidion</i>			<i>constrictum</i>	X	X	X
<i>Bembidion</i>			<i>contractum</i>	X	X	X
<i>Bembidion</i>			<i>fortestriatum</i>	X	X	X
<i>Bembidion</i>			<i>frontale</i>	X	X	X
<i>Bembidion</i>			<i>graciliforme</i>	X	X	X
<i>Bembidion</i>			<i>grapii</i>	X	X	X
<i>Bembidion</i>			<i>honestum</i>	X	X	X
<i>Bembidion</i>			<i>immaturum</i>	X	X	X
<i>Bembidion</i>			<i>impotens</i>	-	X	X
<i>Bembidion</i>			<i>inaequale inaequale</i>	X	X	X
<i>Bembidion</i>			<i>inrematum</i>	X	X	X
<i>Bembidion</i>			<i>intermedium</i>	X	-	-
<i>Bembidion</i>			<i>lacunarium</i>	X	X	X
<i>Bembidion</i>			<i>levettei</i>	X	X	X
<i>Bembidion</i>			<i>levigatum</i>	-	X	X
<i>Bembidion</i>			<i>louisella</i>	X	X	X
<i>Bembidion</i>			<i>mimus</i>	X	X	X
<i>Bembidion</i>			<i>muscolica</i>	X	X	X
<i>Bembidion</i>			<i>mutatum</i>	X	X	X
<i>Bembidion</i>			<i>nigripes</i>	X	X	X
<i>Bembidion</i>			<i>nigrivestis</i>	X	X	X

Continued on next page

Table 1. Continued.

Subfamily	Tribe	Genus	Species	This study	Bousquet 2012	Majka et al. 2011
		<i>Bembidion</i>	<i>nigrum</i>	X	X	X
		<i>Bembidion</i>	<i>nitidum</i>	X	X	X
		<i>Bembidion</i>	<i>oberthueri</i>	X	X	X
		<i>Bembidion</i>	<i>obscurum</i>	X	X	X
		<i>Bembidion</i>	<i>occultator</i>	X	X	X
		<i>Bembidion</i>	<i>patruale</i>	X	X	X
		<i>Bembidion</i>	<i>petrosum petrosum</i>	X	X	X
		<i>Bembidion</i>	<i>planum</i>	X	X	X
		<i>Bembidion</i>	<i>postremum</i>	X	X	X
		<i>Bembidion</i>	<i>praticola</i>	X	X	X
		<i>Bembidion</i>	<i>properans</i>	X	X	X
		<i>Bembidion</i>	<i>pseudocautum</i>	X	X	X
		<i>Bembidion</i>	<i>punctatostriatum</i>	X	X	X
		<i>Bembidion</i>	<i>quadratum</i>	X	X	X
		<i>Bembidion</i>	<i>quadrimaculatum oppositum</i>	X	X	X
		<i>Bembidion</i>	<i>rapidum</i>	X	X	X
		<i>Bembidion</i>	<i>rolandi</i>	X	X	X
		<i>Bembidion</i>	<i>rothfelsi</i>	X	X	X
		<i>Bembidion</i>	<i>rusticum rusticum</i>	X	X	X
		<i>Bembidion</i>	<i>salebratum</i>	X	X	X
		<i>Bembidion</i>	<i>scopulinum</i>	X	X	X
		<i>Bembidion</i>	<i>sejunctum sejunctum</i>	X	-	-
		<i>Bembidion</i>	<i>semicinctum</i>	X	X	X
		<i>Bembidion</i>	<i>semistriatum</i>	X	X	X
		<i>Bembidion</i>	<i>simplex</i>	X	X	X
		<i>Bembidion</i>	<i>stephensii</i>	X	X	X
		<i>Bembidion</i>	<i>tetracolum</i>	X	X	X
		<i>Bembidion</i>	<i>transparens</i>	X	X	X
		<i>Bembidion</i>	<i>variegatum</i>	X	X	X
		<i>Bembidion</i>	<i>versicolor</i>	X	X	X
		<i>Bembidion</i>	<i>versutum</i>	X	X	X
		<i>Bembidion</i>	<i>wingatei</i>	X	X	X
	Xystosomina	<i>Mioptachys</i>	<i>flavicauda</i>	X	X	X
	Tachyina	<i>Tachyta</i>	<i>angulata</i>	X	X	X
		<i>Tachyta</i>	<i>nana inornata</i>	X	X	X
		<i>Tachyta</i>	<i>nana kirbyi</i>	X	X	X
		<i>Tachyta</i>	<i>parvicornis</i>	X	-	-
		<i>Elaphropus</i>	<i>anceps</i>	X	X	X
		<i>Elaphropus</i>	<i>dolosus</i>	X	-	-
		<i>Elaphropus</i>	<i>granarius</i>	X	X	X
		<i>Elaphropus</i>	<i>incurvus</i>	X	X	X
		<i>Elaphropus</i>	<i>saturatus</i>	X	X	X
		<i>Elaphropus</i>	<i>tripunctatus</i>	X	X	X
		<i>Elaphropus</i>	<i>verniciatus</i>	X	X	X
		<i>Elaphropus</i>	<i>vivax</i>	X	X	X
		<i>Elaphropus</i>	<i>xanthopus</i>	-	X	X
		<i>Porotachys</i>	<i>bisulcatus</i>	X	X	X
		<i>Polyderis</i>	<i>laevis</i>	X	X	X
		<i>Paratachys</i>	<i>proximus</i>	-	X	X
		<i>Paratachys</i>	<i>scitulus</i>	X	X	X
Patrobinae	Patrobini	<i>Diplois</i>	<i>rugicollis</i>	X	X	X
		<i>Patrobus</i>	<i>foveocollis</i>	-	X	X
		<i>Patrobus</i>	<i>longicornis</i>	X	X	X
		<i>Patrobus</i>	<i>septentrionis</i>	X	X	X
		<i>Patrobus</i>	<i>stygicus</i>	X	X	X
		<i>Platypatrobus</i>	<i>lacustris</i>	X	X	X
Psydrinae	Psydrini	<i>Nomius</i>	<i>pygmaeus</i>	X	X	X

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Table 1. Continued.

Subfamily	Tribe	Genus	Species	This study	Bousquet 2012	Majka et al. 2011	
Brachininae	Brachinini	<i>Brachinus</i>	<i>condicollis</i>	X	X	X	
		<i>Brachinus</i>	<i>cyanipennis</i>	X	X	X	
		<i>Brachinus</i>	<i>cyanochroaticus</i>	X	X	X	
		<i>Brachinus</i>	<i>fumans</i>	X	X	X	
		<i>Brachinus</i>	<i>janthinipennis</i>	X	X	X	
		<i>Brachinus</i>	<i>medius</i>	X	X	X	
		<i>Brachinus</i>	<i>ovipennis</i>	X	X	X	
		<i>Brachinus</i>	<i>patruelis</i>	X	X	X	
Harpalinae	Pterostichini	<i>Brachinus</i>	<i>vulcanoides</i>	X	-	-	
		<i>Poecilus</i>	<i>chalcites</i>	X	X	X	
		<i>Poecilus</i>	<i>lucublandus lucublandus</i>	X	X	X	
		<i>Gastrellarius</i>	<i>honestus</i>	X	X	X	
		<i>Stereocerus</i>	<i>haematopus</i>	X	X	X	
		<i>Myas</i>	<i>coracinus</i>	X	-	-	
		<i>Myas</i>	<i>cyanescens</i>	X	X	X	
		<i>Pterostichus</i>	<i>adoxus</i>	X	X	X	
		<i>Pterostichus</i>	<i>adstrictus</i>	X	X	X	
		<i>Pterostichus</i>	<i>arcticola</i>	X	X	X	
		<i>Pterostichus</i>	<i>brevicornis</i>	X	X	X	
		<i>Pterostichus</i>	<i>caudicalis</i>	X	X	X	
		<i>Pterostichus</i>	<i>commutabilis</i>	X	X	X	
		<i>Pterostichus</i>	<i>coracinus</i>	X	X	X	
		<i>Pterostichus</i>	<i>corruscus</i>	X	X	X	
		<i>Pterostichus</i>	<i>corvinus</i>	X	X	X	
		<i>Pterostichus</i>	<i>diligendus</i>	X	X	X	
		<i>Pterostichus</i>	<i>lachrymosus</i>	X	X	X	
		<i>Pterostichus</i>	<i>luctuosus</i>	X	X	X	
		<i>Pterostichus</i>	<i>melanarius</i>	X	X	X	
		<i>Pterostichus</i>	<i>mutus</i>	X	X	X	
		<i>Pterostichus</i>	<i>patruelis</i>	X	X	X	
		<i>Pterostichus</i>	<i>pensylvanicus</i>	X	X	X	
		<i>Pterostichus</i>	<i>pinguedineus</i>	X	X	X	
		<i>Pterostichus</i>	<i>praetermissus</i>	X	X	X	
		<i>Pterostichus</i>	<i>punctatissimus</i>	X	X	X	
		<i>Pterostichus</i>	<i>rostratus</i>	X	X	X	
		<i>Pterostichus</i>	<i>stygius</i>	X	X	X	
		<i>Pterostichus</i>	<i>tenuis</i>	X	X	X	
		<i>Pterostichus</i>	<i>tristis</i>	X	X	X	
		Zabrini	<i>Amara</i>	<i>aenea</i>	X	X	X
			<i>Amara</i>	<i>aeneopolita</i>	X	X	X
			<i>Amara</i>	<i>alpina</i>	X	X	X
			<i>Amara</i>	<i>angustata</i>	X	X	X
			<i>Amara</i>	<i>angustatoides</i>	X	X	X
			<i>Amara</i>	<i>anthobia</i>	X	-	-
			<i>Amara</i>	<i>apricaria</i>	X	X	X
			<i>Amara</i>	<i>aulica</i>	X	X	X
<i>Amara</i>	<i>avida</i>		X	X	X		
<i>Amara</i>	<i>bifrons</i>		X	X	X		
<i>Amara</i>	<i>chalcea</i>		X	X	X		
<i>Amara</i>	<i>convexa</i>		X	X	X		
<i>Amara</i>	<i>crassispina</i>		-	X	X		
<i>Amara</i>	<i>cupreolata</i>		X	X	X		
<i>Amara</i>	<i>erratica</i>		X	X	X		
<i>Amara</i>	<i>familiaris</i>		X	X	X		
<i>Amara</i>	<i>flebilis</i>		X	X	X		
<i>Amara</i>	<i>impuncticollis</i>		X	X	X		
<i>Amara</i>	<i>laevipennis</i>		X	X	X		
<i>Amara</i>	<i>latior</i>		X	X	X		

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Table 1. Continued.

Subfamily	Tribe	Genus	Species	This study	Bousquet 2012	Majka et al. 2011
		<i>Amara</i>	<i>littoralis</i>	X	X	X
		<i>Amara</i>	<i>lunicollis</i>	X	X	X
		<i>Amara</i>	<i>musculus</i>	X	X	X
		<i>Amara</i>	<i>neoscotica</i>	-	X	X
		<i>Amara</i>	<i>obesa</i>	X	X	X
		<i>Amara</i>	<i>otiosa</i>	X	X	X
		<i>Amara</i>	<i>pallipes</i>	X	X	X
		<i>Amara</i>	<i>patruelis</i>	X	X	X
		<i>Amara</i>	<i>quenseli</i>	X	X	X
		<i>Amara</i>	<i>rubrica</i>	X	X	X
		<i>Amara</i>	<i>sinuosa</i>	X	X	X
		<i>Amara</i>	<i>torrida</i>	X	X	X
	Oodini	<i>Oodes</i>	<i>amaroides</i>	X	X	X
		<i>Oodes</i>	<i>fluvialis</i>	X	X	X
		<i>Lachnocrepis</i>	<i>parallela</i>	X	X	X
	Panagaeini	<i>Panagaeus</i>	<i>fasciatus</i>	X	-	-
	Chlaeniini	<i>Chlaenius</i>	<i>cordicollis</i>	X	X	X
		<i>Chlaenius</i>	<i>emarginatus</i>	X	X	X
		<i>Chlaenius</i>	<i>impunctifrons</i>	X	X	X
		<i>Chlaenius</i>	<i>laticollis</i>	X	X	X
		<i>Chlaenius</i>	<i>lithophilus lithophilus</i>	X	X	X
		<i>Chlaenius</i>	<i>niger</i>	X	X	X
		<i>Chlaenius</i>	<i>pensylvanicus pensylvanicus</i>	X	X	X
		<i>Chlaenius</i>	<i>sericeus sericeus</i>	X	X	X
		<i>Chlaenius</i>	<i>tomentosus tomentosus</i>	X	X	X
		<i>Chlaenius</i>	<i>tricolor tricolor</i>	X	X	X
	Licinini	<i>Diplocheila</i>	<i>assimilis</i>	X	X	X
		<i>Diplocheila</i>	<i>impressicollis</i>	X	-	-
		<i>Diplocheila</i>	<i>obtusa</i>	X	X	X
		<i>Dicaelus</i>	<i>dilatatus dilatatus</i>	X	X	X
		<i>Dicaelus</i>	<i>elongatus</i>	X	X	X
		<i>Dicaelus</i>	<i>politus</i>	X	X	X
		<i>Badister</i>	<i>grandiceps</i>	X	X	X
		<i>Badister</i>	<i>neopulchellus</i>	X	X	X
		<i>Badister</i>	<i>notatus</i>	X	X	X
		<i>Badister</i>	<i>micans (=ocularis)</i>	X	X	X
		<i>Badister</i>	<i>obtusus</i>	X	X	X
		<i>Badister</i>	<i>transversus</i>	X	X	X
	Harpalini					
	Anisodactylina	<i>Notiobia</i>	<i>nitidipennis</i>	-	X	X
		<i>Notiobia</i>	<i>terminata</i>	X	X	X
		<i>Xestonotus</i>	<i>lugubris</i>	X	X	X
		<i>Anisodactylus</i>	<i>agricola</i>	X	X	X
		<i>Anisodactylus</i>	<i>discoideus</i>	X	X	X
		<i>Anisodactylus</i>	<i>harrisii</i>	X	X	X
		<i>Anisodactylus</i>	<i>kirbyi</i>	X	X	X
		<i>Anisodactylus</i>	<i>laetus</i>	X	-	-
		<i>Anisodactylus</i>	<i>merula</i>	X	X	X
		<i>Anisodactylus</i>	<i>nigerrimus</i>	X	X	X
		<i>Anisodactylus</i>	<i>nigrita</i>	X	X	X
		<i>Anisodactylus</i>	<i>rusticus</i>	X	X	X
		<i>Anisodactylus</i>	<i>sanctaeacrucis</i>	X	X	X
		<i>Anisodactylus</i>	<i>verticalis</i>	X	X	X
		<i>Geopinus</i>	<i>incrassatus</i>	X	X	X
		<i>Amphasia</i>	<i>interstitialis</i>	X	X	X
		<i>Amphasia</i>	<i>sericea</i>	X	X	X
	Stenolophina	<i>Dicheirotichus</i>	<i>cognatus</i>	X	X	X
		<i>Bradycellus</i>	<i>atrimeus</i>	X	X	X

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Table 1. Continued.

Subfamily	Tribe	Genus	Species	This study	Bousquet 2012	Majka et al. 2011
		<i>Bradycellus</i>	<i>badipennis</i>	X	X	X
		<i>Bradycellus</i>	<i>congener</i>	X	X	X
		<i>Bradycellus</i>	<i>kirbyi</i>	X	X	X
		<i>Bradycellus</i>	<i>lecontei</i>	X	X	X
		<i>Bradycellus</i>	<i>lugubris</i>	X	X	X
		<i>Bradycellus</i>	<i>neglectus</i>	X	X	X
		<i>Bradycellus</i>	<i>nigriceps</i>	X	X	X
		<i>Bradycellus</i>	<i>nigrinus</i>	X	X	X
		<i>Bradycellus</i>	<i>rupestris</i>	X	X	X
		<i>Bradycellus</i>	<i>semipubescens</i>	X	X	X
		<i>Bradycellus</i>	<i>tantillus</i>	-	X	X
		<i>Stenolophus</i>	<i>comma</i>	X	X	X
		<i>Stenolophus</i>	<i>conjunctus</i>	X	X	X
		<i>Stenolophus</i>	<i>fuliginosus</i>	X	X	X
		<i>Stenolophus</i>	<i>fuscatus</i>	X	X	X
		<i>Stenolophus</i>	<i>humidus</i>	X	X	X
		<i>Stenolophus</i>	<i>lecontei</i>	X	X	X
		<i>Stenolophus</i>	<i>lineola</i>	X	X	X
		<i>Stenolophus</i>	<i>ochropezus</i>	X	X	X
		<i>Stenolophus</i>	<i>plebejus</i>	X	X	X
		<i>Stenolophus</i>	<i>rotundicollis</i>	X	X	X
		<i>Acupalpus</i>	<i>canadensis</i>	X	X	X
		<i>Acupalpus</i>	<i>carus</i>	X	X	X
		<i>Acupalpus</i>	<i>indistinctus</i>	X	X	X
		<i>Acupalpus</i>	<i>nanellus</i>	-	X	X
		<i>Acupalpus</i>	<i>partiaris</i>	X	X	X
		<i>Acupalpus</i>	<i>pauperculus</i>	X	X	X
		<i>Acupalpus</i>	<i>pumilus</i>	X	X	X
		<i>Acupalpus</i>	<i>testaceus</i>	-	X	X
	Harpalina	<i>Ophonus</i>	<i>puncticeps</i>	X	X	X
		<i>Harpalus</i>	<i>affinis</i>	X	X	X
		<i>Harpalus</i>	<i>caliginosus</i>	X	X	X
		<i>Harpalus</i>	<i>compar</i>	X	X	X
		<i>Harpalus</i>	<i>erraticus</i>	X	X	X
		<i>Harpalus</i>	<i>erythropus</i>	X	X	X
		<i>Harpalus</i>	<i>faunus</i>	X	X	X
		<i>Harpalus</i>	<i>fulvilabris</i>	X	X	X
		<i>Harpalus</i>	<i>herbivagus</i>	X	X	X
		<i>Harpalus</i>	<i>indigenus</i>	X	X	X
		<i>Harpalus</i>	<i>laevipes</i>	X	X	X
		<i>Harpalus</i>	<i>laticeps</i>	X	X	X
		<i>Harpalus</i>	<i>lewisii</i>	X	X	X
		<i>Harpalus</i>	<i>megacephalus</i>	-	X	X
		<i>Harpalus</i>	<i>opacipennis</i>	X	X	X
		<i>Harpalus</i>	<i>pensylvanicus</i>	X	X	X
		<i>Harpalus</i>	<i>plentalis</i>	X	X	X
		<i>Harpalus</i>	<i>providens</i>	X	X	X
		<i>Harpalus</i>	<i>reversus</i>	X	X	X
		<i>Harpalus</i>	<i>rubripes</i>	X	X	X
		<i>Harpalus</i>	<i>rufipes</i>	X	X	X
		<i>Harpalus</i>	<i>solitaris</i>	X	X	X
		<i>Harpalus</i>	<i>sommulentus</i>	X	X	X
		<i>Trichotichnus</i>	<i>autumnalis</i>	X	X	X
		<i>Trichotichnus</i>	<i>vulpeculus</i>	X	X	X
		<i>Selenophorus</i>	<i>ellipticus</i>	-	X	X
		<i>Selenophorus</i>	<i>gagatinus</i>	X	X	X
		<i>Selenophorus</i>	<i>hylacis</i>	X	X	X
		<i>Selenophorus</i>	<i>opalinus</i>	X	X	X

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Table 1. Continued.

Subfamily	Tribe	Genus	Species	This study	Bousquet 2012	Majka et al. 2011
	Pentagonicini	<i>Pentagonica</i>	<i>picticornis</i>	X	-	-
	Sphodrini					
	Atranopsina	<i>Pseudamara</i>	<i>arenaria</i>	X	X	X
	Calathina	<i>Calathus</i>	<i>gregarius</i>	X	X	X
		<i>Calathus</i>	<i>ingratus</i>	X	X	X
		<i>Calathus</i>	<i>opaculus</i>	-	X	X
		<i>Acalathus</i>	<i>advena</i>	X	X	X
		<i>Synuchus</i>	<i>impunctatus</i>	X	X	X
	Platynini					
	Platynina	<i>Olisthopus</i>	<i>micans</i>	X	-	-
		<i>Olisthopus</i>	<i>parmatius</i>	X	X	X
		<i>Sericoda</i>	<i>obsoleta</i>	X	X	X
		<i>Sericoda</i>	<i>quadripunctata</i>	X	X	X
		<i>Paranchus</i>	<i>albipes</i>	X	X	X
		<i>Oxypselaphus</i>	<i>pusillus</i>	X	X	X
		<i>Agonum</i>	<i>aeruginosum</i>	X	X	X
		<i>Agonum</i>	<i>affine</i>	X	X	X
		<i>Agonum</i>	<i>anchomenoides</i>	X	X	X
		<i>Agonum</i>	<i>canadense</i>	X	X	X
		<i>Agonum</i>	<i>crenistriatum</i>	X	X	X
		<i>Agonum</i>	<i>cupreum</i>	X	-	-
		<i>Agonum</i>	<i>cupripenne</i>	X	X	X
		<i>Agonum</i>	<i>darlingtoni</i>	X	X	X
		<i>Agonum</i>	<i>deceptivum</i>	X	X	X
		<i>Agonum</i>	<i>decorum</i>	-	X	X
		<i>Agonum</i>	<i>excavatum</i>	X	X	X
		<i>Agonum</i>	<i>extensicolle</i>	X	X	X
		<i>Agonum</i>	<i>fidele</i>	X	X	X
		<i>Agonum</i>	<i>gratiosum</i>	X	X	X
		<i>Agonum</i>	<i>harrisii</i>	X	X	X
		<i>Agonum</i>	<i>lutulentum</i>	X	X	X
		<i>Agonum</i>	<i>melanarium</i>	X	X	X
		<i>Agonum</i>	<i>metallescens</i>	X	X	X
		<i>Agonum</i>	<i>moerens</i>	X	X	X
		<i>Agonum</i>	<i>muelleri</i>	X	X	X
		<i>Agonum</i>	<i>mutatum</i>	X	X	X
		<i>Agonum</i>	<i>nigriceps</i>	X	X	X
		<i>Agonum</i>	<i>nutans</i>	-	X	X
		<i>Agonum</i>	<i>octopunctatum</i>	X	X	X
		<i>Agonum</i>	<i>palustre</i>	X	X	X
		<i>Agonum</i>	<i>piceolum</i>	X	X	X
		<i>Agonum</i>	<i>pivicornoides</i>	X	X	X
		<i>Agonum</i>	<i>placidum</i>	X	X	X
		<i>Agonum</i>	<i>propinquum</i>	X	X	X
		<i>Agonum</i>	<i>retractum</i>	X	X	X
		<i>Agonum</i>	<i>sordens</i>	X	X	X
		<i>Agonum</i>	<i>superioris</i>	X	X	X
		<i>Agonum</i>	<i>tenuis</i>	X	X	X
		<i>Agonum</i>	<i>thoreyi</i>	X	X	X
		<i>Agonum</i>	<i>trigeminum</i>	X	X	X
		<i>Platynus</i>	<i>decens</i>	X	X	X
		<i>Platynus</i>	<i>indecens</i>	X	X	X
		<i>Platynus</i>	<i>mannerheimi</i>	X	X	X
		<i>Platynus</i>	<i>tenuicollis</i>	X	X	X
	Atranini	<i>Atranus</i>	<i>pubescens</i>	X	X	X
	Perigonini	<i>Perigona</i>	<i>nigriceps</i>	X	X	X
		<i>Perigona</i>	<i>pallipennis</i>	X	X	X
	Odecanthini	<i>Colliuris</i>	<i>pensylvanica</i>	X	X	X

Continued on next page

Table 1. Continued.

Subfamily	Tribe	Genus	Species	This study	Bousquet 2012	Majka <i>et al.</i> 2011
	Cyclosomini	<i>Tetragonoderus</i>	<i>fasciatus</i>	X	X	X
	Lebiini					
	Cymindidina	<i>Cymindis</i>	<i>borealis</i>	X	X	X
		<i>Cymindis</i>	<i>cribricollis</i>	X	X	X
		<i>Cymindis</i>	<i>limbata</i>	X	X	X
		<i>Cymindis</i>	<i>neglectus</i>	X	X	X
		<i>Cymindis</i>	<i>pilosa</i>	X	X	X
		<i>Cymindis</i>	<i>platicollis</i>	X	X	X
		<i>Cymindis</i>	<i>unicolor</i>	X	X	X
	Dromiina	<i>Dromius</i>	<i>piceus</i>	X	X	X
		<i>Axinopalpus</i>	<i>biplagiatus</i>	X	X	X
		<i>Apristis</i>	<i>latens</i>	X	X	X
		<i>Apristis</i>	<i>subsulcatus</i>	X	X	X
		<i>Microlestes</i>	<i>linearis</i>	X	X	X
		<i>Syntomus</i>	<i>americanus</i>	X	X	X
	Lebiina	<i>Lebia</i>	<i>atriventris</i>	X	X	X
		<i>Lebia</i>	<i>fuscata</i>	X	X	X
		<i>Lebia</i>	<i>grandis</i>	X	-	-
		<i>Lebia</i>	<i>lobulata</i>	-	X	X
		<i>Lebia</i>	<i>moesta</i>	X	X	X
		<i>Lebia</i>	<i>ornata</i>	X	X	X
		<i>Lebia</i>	<i>pumila</i>	X	X	X
		<i>Lebia</i>	<i>solea</i>	X	X	X
		<i>Lebia</i>	<i>tricolor</i>	X	X	X
		<i>Lebia</i>	<i>viridipennis</i>	X	X	X
		<i>Lebia</i>	<i>viridis</i>	X	X	X
		<i>Lebia</i>	<i>vittata</i>	X	X	X
	Calleidina	<i>Calleida</i>	<i>punctata</i>	X	X	X
		<b>425 spp.</b>		<b>402</b>	<b>411</b>	<b>411</b>

adventive *H. rufipes*, first documented on Prince Edward Island in 1937, but now found throughout the Maritime Provinces and southern Québec in Canada, as well as all six states of New England (Bousquet 2012).

*Chlaenius laticollis* Say, previously unknown from north of New Hampshire (Bell 1960), was abundant in 1999 in an inner coastal salt marsh in Phippsburg (Sagadahoc County), in the mid-coast section of the state. This represents a significant range extension for a species that would certainly have been collected had it been present earlier; its relatively large size (12–14 mm) and bright blue-green color make it difficult to miss.

Majka *et al.* (2011) presented the first documentation for the genus *Olisthopus* Dejean from Maine. To their records of *Olisthopus parmatus* (Say), we add a singular record of the much smaller *Olisthopus micans* LeConte from the southern part of the state.

Majka *et al.* (2011) listed *O. labiatum* from the Maine fauna, but re-evaluation of the records suggests this was a database error. We have been unable to locate any specimen of the species that was collected within the state, although its con-

firmed presence in Nova Scotia (Lindroth 1969a; Bousquet 2012) means it likely is indeed part of the state fauna, since it is found south to Florida, along the Atlantic and Gulf coasts west to Texas.

Tiger beetles, tribe Cicindelini, are among the better-known groups of ground beetles in the state (Wilson and Brower 1983). *Cicindela scutellaris lecontei* Haldeman was expected to be found in the state fauna by Wilson and Brower (1983), but was only first documented in the state relatively recently (Nelson and LaBonte 1989); collecting in this study, however, has revealed that the species is indeed widespread in the central and southern part of the state, with specimens collected in 13 townships in four of the biophysical regions (see Plate 25). *Cicindela punctulata* Olivier has likewise now been documented to occur at least as far north as the town of Fairfield (southernmost Somerset County; Plate 25). *Cicindela marginipennis* Dejean was only first found in the state in 2009 (Ward and Mays 2010; Plate 25).

The carabid fauna of the state of Maine presented here represents the most complete accounting thus far available. It is fully expected that new species will undoubtedly be added to the list in

the future, particularly as active collecting is currently underway in the southernmost extremities of the state. Much collecting has taken place since this project was undertaken, and numerous additional specimens are not here documented. However, this presents at least a basal documentation of the known fauna, which also shows what vast areas of the state remain to be sampled.

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## APPENDIX 1

## THE CARABID FAUNA OF MAINE

Descriptions of the species' general habitats, flight dynamics, overall biology (so far as is known), general range, and localities where each has been collected in Maine are provided. Approximately half the state of Maine is unorganized townships, many with numeric names (*e.g.*, T2 R4 WELS). WELS represents West of the Easterly Line of the State and is part of the formal township name. A list of all unorganized townships by county is available at [www.maine.gov/revenue/propertytax/unorganizedterritory/township\\_map.htm](http://www.maine.gov/revenue/propertytax/unorganizedterritory/township_map.htm).

**Abbreviations of Collections Mentioned in Text.** CNC = Canadian National Collection, Ottawa; Maddison = record based on Maddison (2008); MCZ = Museum of Comparative Zoology, Harvard University; MFS = Maine Forest Service Collection, Augusta; MIFW = Maine Dept. of Inland Fisheries and Wildlife Collection, Augusta; PROC = Procter Collection, Acadia National Park; PVT = Private Collection; RENC = R. E. Nelson collection; RPWC = Reginald P. Webster Collection; UCD = University of California at Davis (1 specimen only); UNH = University of New Hampshire Collection; UVM = University of Vermont Collection.

**Arrangement.** The following section is arranged systematically, following the scheme of Bousquet (2012). For those unfamiliar with this structure, the following synopsis shows where the various genera will be found in the classification scheme. The plates, however, will show the species in strictly alphabetical arrangement. Individual species descriptions will include information on which plate to consult to see the mapped distribution of the individual species.

**Subfamily Nebriinae**

Tribe Nebriini

Genus *Nebria*

Tribe Notiophilini

Genus *Notiophilus***Subfamily Carabinae**

Tribe Cychrini

Genus *Scaphinotus*Genus *Sphaeroderus*

Tribe Carabini

Genus *Calosoma*Genus *Carabus***Subfamily Cicindelinae**

Tribe Cicindelini

Genus *Cicindela***Subfamily Loricarinae**

Tribe Loricerini

Genus *Loricera***Subfamily Elaphrinae**

Tribe Elaphrini

Genus *Blethisa*Genus *Elaphrus***Subfamily Omophroninae**

Tribe Omophronini

Genus *Omophron***Subfamily Scaritinae**

Tribe Clivinini

Genus *Clivina*Genus *Schizogenius*Genus *Dyschirius***Subfamily Broscinae**

Tribe Broscini

Genus *Miscodera***Subfamily Trechinae**

Tribe Trechini

Genus *Trechus*Genus *Blemus*

Tribe Bembidiini

Subtribe Bembidiina

Genus *Asaphidion*Genus *Bembidion*

Subtribe Xystosomina

Genus *Mioptachys*

Subtribe Tachyina

Genus *Tachyta*Genus *Elaphropus*Genus *Porotachys*Genus *Polyderis*Genus *Paratachys***Subfamily Patrobinae**

Tribe Patrobini

Genus *Diplous*Genus *Patrobus*Genus *Platypatrobus***Subfamily Psydriinae**

Tribe Psydriini

Genus *Nomius***Subfamily Brachininae**

Tribe Brachinini

Genus *Brachinus***Subfamily Harpalinae**

Supertribe Pterostichitae

Tribe Pterostichini

Genus *Poecilus*Genus *Gastrellarius*Genus *Stereocerus*Genus *Myas*Genus *Pterostichus*

Tribe Zabринi

Genus *Amara*

Tribe Oodini

Genus *Oodes*Genus *Lachnocrepis*

Tribe Panagaeini

Genus *Panagaeus*

Tribe Chlaeniini

Genus *Chlaenius*  
 Supertribe Harpalitae  
 Tribe Licinini  
 Genus *Diplocheila*  
 Genus *Dicaelus*  
 Genus *Badister*  
 Tribe Harpalini  
 Subtribe Anisodactylina  
 Genus *Notiobia*  
 Genus *Xestonotus*  
 Genus *Anisodactylus*  
 Genus *Geopinus*  
 Genus *Amphasia*  
 Subtribe Stenolophina  
 Genus *Dicheirotrichus*  
 Genus *Bradycellus*  
 Genus *Stenolophus*  
 Genus *Acupalpus*  
 Subtriba Harpalina  
 Genus *Ophonus*  
 Genus *Harpalus*  
 Genus *Trichotichnus*  
 Genus *Selenophorus*  
 Tribe Pentagonicini  
 Genus *Pentagonica*  
 Tribe Sphodrini  
 Genus *Pseudamara*  
 Genus *Calathus*  
 Genus *Acalathus*  
 Genus *Synuchus*  
 Tribe Platynini  
 Subtribe Platynina  
 Genus *Olisthopus*  
 Genus *Sericoda*  
 Genus *Paranchus*  
 Genus *Oxypselaphus*  
 Genus *Agonum*  
 Genus *Platynus*  
 Tribe Atranini  
 Genus *Atranus*  
 Tribe Perigonini  
 Genus *Perigona*  
 Tribe Odacanthini  
 Genus *Colliuris*  
 Tribe Cyclosomini  
 Genus *Tetragonoderus*  
 Tribe Lebiini  
 Subtribe Cymindidina  
 Genus *Cymindis*  
 Subtribe Dromiina  
 Genus *Dromius*  
 Genus *Axinopalpus*  
 Genus *Apristus*  
 Genus *Microlestes*  
 Genus *Syntomus*  
 Subtribe Lebiina  
 Genus *Lebia*  
 Subtribe Calleidina  
 Genus *Calleida*

## Subfamily Nebriinae

### Tribe Nebriini

#### Genus *Nebria*

#### *Nebria gyllenhali castanipes* (Kirby) (Plate 35)

**Habitat:** Borders of generally cold rivers and brooks, along lakes and ponds, under stones and dry leaves. In Maine, restricted to alpine habitats, though it occurs in alpine and subalpine zones in the White Mountains of Vermont.

**Flight dynamics:** Fully winged, no flight records.

**Biology:** General adults appear in fall in the White Mountains of New Hampshire, earlier in summer farther north; overwinters as a larva in southern part of range, both as adult and larva in northern part of range; gravid females appear in June. Eats small flies and springtails but does not regurgitate defensively.

**General range:** The species as a whole is circum-polar; *N. gyllenhali castanipes* is a northern transcontinental subspecies in North America. Northeast to Labrador and Newfoundland, in Québec north to the Hudson Strait, in Ontario north to Hudson Bay, northern Saskatchewan, northern Manitoba, in the Northwest Territories north to Norman Wells, northwest to Circle, Alaska, thence west to the Pacific Ocean, south in the mountains to Oregon and Wyoming, in Québec south to Baie-St-Paul, farther south in the mountains of New England including the White Mountains of New Hampshire and Maine, Mt. Katahdin (Maine) and the Adirondacks in New York. *Nebria gyllenhali lindrothi* Kavanaugh is found in the Rocky Mountains and *Nebria gyllenhali lassenensis* Kavanaugh occurs in the Cascade Range of Oregon and California; *Nebria gyllenhali gyllenhali* Schönherr occurs in the Old World from northern Sweden, across Russia and Siberia, with isolated populations in Greenland, Iceland, the mountains of the northern British Isles, the Pyrenees, Alps, and high mountains of Bulgaria and Albania.

**Maine localities (2):** Mount Desert (PROC), Mt. Katahdin Township (RENC).

#### *Nebria lacustris lacustris* Casey (Plate 35)

**Habitat:** Sand bars along lake shores, rivers, and smaller streams including heavily shaded mountain brooks.

**Flight dynamics:** Fully winged, no flight records.

**Biology:** Eggs are laid in August, larval development occurs in fall and winter, and larvae disappear by January; adults disappear in early September; old adults reappear in late May, general adults in June.

**General range:** An eastern and central North American species. Northeast to New Brunswick,

in Québec along the St. Lawrence River to Chutes-aux-Outardes on the North Shore, northwest to Minnesota, west to Iowa, Illinois, Kentucky, Tennessee, and Virginia. There is another subspecies (*Nebria lacustris bellorum* Kavanaugh) in the southern Appalachians.

**Maine localities (26):** Andover (CNC), Augusta (PVT), Batchelders Grant Township (RENC), Benton (PVT), Caratunk (RENC), Carrabassett Valley (PVT, RENC), Chain of Ponds Township (CNC), Eustis (CNC), Fort Kent (CNC, UVM), Fryeburg (CNC), Grafton Township (CNC), Mexico (CNC), New Portland (RENC), New Sharon (PVT), Newry (UVM), Norridgewock (RENC), Pittston Academy Grant (RPWC), Sandy Bay Township (CNC), Sidney (RENC), Skowhegan (RENC), Stoneham (RENC), Strong (RENC), Vassalboro (PVT), Waterville (RENC), Weld (CNC), Winslow (PVT, RENC).

***Nebria nivalis gaspesiana* Kavanaugh (Plate 35)**

**Habitat:** In tundra around snow patches.

**Flight dynamics:** Fully winged, no flight records.

**Biology:** Teneral adults have been found in late June; may hibernate in both larval and adult stages.

**General range:** A northeastern subspecies of a Holarctic species. North in Québec to Rivière Abloviak (east of Ungava Bay), south to the west coast of Newfoundland and in the high mountains of Gaspé, Mt. Katahdin (Maine), and Mt. Washington (New Hampshire), but may be extirpated at the type locality on Mount Albert, on the Gaspé Peninsula of Québec. Nominate subspecies (*Nebria nivalis nivalis* Paykull) occurs in the Arctic of Scandinavia, Russia, and high mountains of Norway and Scotland, also on the Arctic shores of North America and in the high mountains of Alaska, Baffin Island in Nunavut and in northern British Columbia.

**Maine locality (1):** Mt. Katahdin Township (PVT).

***Nebria pallipes* Say (Plate 35)**

**Habitat:** On bare sand and gravel banks along rivers, lakes and brooks. Along major rivers, most common below overhanging banks, on various smaller streams with moving currents. In wet weather, it follows temporary brooks in ditches, roads and trails.

**Flight dynamics:** Fully winged, no flight records.

**Biology:** A very swift runner with a tendency to run in tight circles; eggs laid in early September, larvae emerge in late September; third instars may be active well into December, and then disappear; adults disappear by early October. Teneral adults may be found in June

but old, overwintering adults appear earlier, in May; perhaps 10% of the adults overwinter.

**General range:** A northeastern and midwestern species. Northeast to Nova Scotia and New Brunswick, in Québec north to southern Gaspé and Lac St. Jean and Hull, north to Michigan, Wisconsin, west to Illinois, south in the mountains to Tennessee and Georgia.

**Maine localities (40):** Albany Township (CNC), Andover (CNC), Anson (RENC), Appleton (CNC), Auburn (CNC), Augusta (PVT), Batchelders Grant Township (UVM, RENC), Berwick (CNC), Buxton (RENC), Caratunk (CNC), Carrabassett Valley (UVM), Cornish (CNC), East Millinocket (CNC), Farmington (PVT, RENC), Fort Kent (CNC), Kingsbury Plantation (RENC), Lewiston (MFS), Madrid Township (CNC), Monmouth (MFS), Moscow (PVT), Mount Desert (PROC, UVM), Mount Katahdin Township (RENC), Mount Vernon (MFS), New Portland (RENC), New Sharon (PVT), Newry (UVM), Norridgewock (RENC), Oakland (PVT), Readfield (CNC) Sidney (RENC), Stoneham (RENC), Strong (RENC), T2 R4 WELS (CNC), T3 R10 WELS (CNC), Unity (PVT), Vienna (RENC), Waterboro (RENC), Waterville (RENC), Weld (CNC), Whitefield (RENC).

***Nebria suturalis* LeConte (state record only from Bousquet (2010, 2012))**

**Habitat:** Open ground, alpine environments, along small clear, cold streams or trickles; also on rocky scree slopes with damp soils.

**Flight dynamics:** Both fully winged and short-winged forms occur.

**Biology:** Teneral adults appear in late July to early August; adults generally found active in summer months (June through August).

**General range:** Apparently disjunct, with eastern specimens known from Labrador, New Hampshire, Québec, Vermont, Maine, Ontario, and New York, and western records from Alberta, Colorado, and Wyoming.

**Maine localities:** No specific Maine localities known.

**Tribe Notiophilini**

**Genus *Notiophilus***

***Notiophilus aeneus* (Herbst) (Plate 36)**

**Habitat:** In leaf litter of deciduous forests, generally on damp to dry ground where undergrowth is minimal.

**Flight dynamics:** Fully winged, sometimes at light traps.

**Biology:** Teneral adults appear in mid-September and overwinter as adults. This is a fast-moving

predator depending on stereoscopic vision, feeding primarily on Collembola. In spring, it is active in full sunlight, most obvious before new leaves have expanded, but becomes crepuscular in warmer months, seen running where leaf litter is thin or absent, such as around the bases of trees or on the hummocks which result from wind throws.

**General range:** An eastern and central species. Northeast to Nova Scotia and New Brunswick, in Québec north to Baie Chaleur, Lac St. Jean, and Hull, in Ontario north to Toronto, in Michigan north to Marquette on Lake Superior, west to Wisconsin, Minnesota, southwest to Iowa, Missouri, east and south to Tennessee, Georgia, and South Carolina.

**Maine localities (30):** Anson (RENC), Bar Harbor (PROC, UVM), Batchelders Grant Township (RENC), Byron (CNC), Camden (CNC), Chain of Ponds Township (CNC), Deer Isle (RENC), Fairfield (RENC), Gorham (PVT), Jackman (CNC), Jonesboro (UNH), Lewiston (MFS), Lincoln (UNH), Lyman (MFS, RENC), Moscow (RENC), Mount Katahdin Township (RENC), Mount Vernon (MFS), Nesourdnahunk Township (CNC), New Sharon (RENC), Oakland (RENC), Oxbow Plantation (MFS), Parsonsfield (MFS), Sidney (RENC), T2 R4 WELS (CNC), T8 R5 WELS (MFS), Topsfield (MFS), Washburn (RENC), Waterville (RENC), Winslow (PVT), Winterville Plantation (MFS).

***Notiophilus aquaticus* (L.) (Plate 36)**

**Habitat:** In the high mountains found on the tundra, farther south in areas of open gravel, sandy paths, even bare soil under trees in an apple orchard.

**Flight dynamics:** Wings dimorphic, flight observed in Europe.

**Biology:** Gravid females appear in late July into mid-August; overwinters either as adult or larva.

**General range:** A circumpolar species. In the Old World, across Scandinavia and Siberia to Kamchatka Peninsula, isolated in the British Isles; in the Faeroe Islands, Iceland, Pyrenees, higher mountains of southern Europe from northern Spain to former Yugoslavia, Asia Minor, Iran, and Caucasus. In North America, northeast to Newfoundland and Labrador, in Québec north to Ft. Chimo, in Ontario and Manitoba north to Hudson Bay, in Alaska north to Brooks Range, west to the Aleutian Islands. Southern limit less well-documented, but known south in the mountains to British Columbia, not in Cascade Range, but south in the Rockies to Montana, Colorado, New Mexico, Arizona, east of the Rockies, south to northern Wisconsin, Michigan, Pennsylvania, and New York.

**Maine localities (2):** Columbia Falls (RENC), Paris (CNC).

***Notiophilus biguttatus* F. (Plate 36)**

**Habitat:** Hardwood forests and clearings, usually among dead leaves.

**Flight dynamics:** Wings dimorphic.

**Biology:** In Europe, teneral adults appear in August into September; breeding takes place in May and June.

**General range:** An Old World species, adventive in the New World. In the Old World, from Scandinavia and the British Isles south to Portugal, southern Italy, Bulgaria, the Caucasus, east to the Ural Mountains and western Siberia including the Ob River Valley. Introduced into Newfoundland by 1923 and on the mainland at least by 1980; a separate introduction occurred at Vancouver, British Columbia, before 1957. The present distribution in the Northeast is northeast to Newfoundland, in Québec only in Rimouski, and southwest into New Hampshire.

**Maine localities (14):** Augusta (MFS), Camden (CNC, UNH), Kittery (UVM), Lewiston (MFS), Machias (RPWC), Monhegan Island Plantation (UVM), Monmouth (MFS), Mount Desert (UVM), Mount Vernon (MFS), Northeast Cary Township (PVT), Oakland (PVT), Portland (PVT), Skowhegan (PVT), Waterville (PVT, RENC).

***Notiophilus borealis* Harris (state records only from Bousquet and Larochelle (1993) and Bousquet (2010))**

**Habitat:** Typically (in our area) at high elevation, on dry, rocky substrates with discontinuous or very short vegetation.

**Flight dynamics:** Most are short-winged and incapable of flight, but fully-winged forms capable of flight are known.

**Biology:** Teneral adults tend to appear in late August into September; adults overwinter. Egg-laying seasonality unknown but probably occurs in early summer.

**General range:** Holarctic; in North America, in the alpine, arctic, and boreal realms, from Newfoundland and Labrador in the east, west to the Northwest Territories, Yukon Territory and Alaska, south of the Canadian border to New York, Vermont, New Hampshire, and Maine.

**Maine localities:** No specific Maine localities known.

***Notiophilus nemoralis* Fall (records from Majka et al. (2011)) (Plate 36)**

**Habitat:** Open subalpine coniferous forests of spruce and fir, on dry ground.

Flight dynamics: All known specimens are short-winged and incapable of flight.

Biology: Teneral adults appear in August; adults overwinter. Egg-laying seasonality unknown but probably occurs in early summer.

General range: In the northeastern USA only – Massachusetts, New York, Vermont, New Hampshire, and Maine.

Maine localities (2): Lewiston (MFS), Augusta (MFS).

***Notiophilus novemstriatus* LeConte (Plate 36)**

Habitat: Dry oak forest edges, especially at cliff tops and bluffs.

Flight dynamics: Wings dimorphic, no flight records.

Biology: Unknown.

General range: An eastern and central North American species. Northeast to Maine, north to the White Mountains of New Hampshire, the Champlain Valley in Vermont, western New York (Batavia), Michigan, west to South Dakota, southwest to Kansas, Oklahoma and Arizona, south to the Gulf of Mexico including Florida.

Maine locality (1): Paris (CNC).

**Subfamily Carabinae**

**Tribe Cychrini**

**Genus *Scaphinotus***

***Scaphinotus bilobus* (Say) (Plate 42)**

Habitat: Thin spruce forest on gravel, under rocks, and in sphagnum and litter in black spruce forests; also in montane forests (e.g., at 763 m in Vermont).

Flight dynamics: Vestigially winged.

Biology: A snail eater; teneral adults appear in July.

General range: A northeast and north-central North American species. Northeast to Nova Scotia and New Brunswick, in Québec north to Lac St. Jean and Abitibi, in Ontario north to Cochrane and Sioux Lookout, north to southern Manitoba, west to Nebraska, Kansas, south to Missouri, northern Illinois, northern Ohio, western New York (Buffalo), isolated in the Adirondacks and Catskills, in New England only in mountains and high plateaus of Vermont, New Hampshire, and northwestern Massachusetts, in Maine in the north and also the southeastern coast.

Maine localities (4): Bar Harbor [Long Porcupine Island] (PROC), Gouldsboro (MFS, PROC), T10 R11 WELS (MFS), T11 R10 WELS (MFS).

***Scaphinotus viduus* Dejean (Plate 42)**

Habitat: Hardwood and mixed forests; in New England at all elevations to treeline. Sometimes found under loose bark.

Flight dynamics: Vestigially winged.

Biology: A snail eater, recorded feeding on the snail *Triodopsis tridentata* (Say), but doubtlessly preys on other species. A large larva was collected in October. Teneral adults appear from late July to late September; hibernates in both the larval and adult stage. A large beetle, it shelters by day in mouse burrows, if disturbed produces large stridulating sound like a rattlesnake, if further disturbed it squirts droplets of a defensive fluid from pygidial glands. These adaptations have been shown to protect it from small mammals. In late afternoon, it moves out of the burrow and shelters under superficial cover in preparation for the night's hunt.

General range: An Appalachian species. Northeast to Nova Scotia and New Brunswick, in Québec north to Québec City, in New York west to Buffalo, across northwestern Pennsylvania to eastern Ohio, south in the mountains to Virginia, North Carolina, and Georgia.

Maine localities (10): Bar Harbor (UNH), Charleston (RENC), Kibby Township (MFS), Milbridge (UVM), Mount Desert (PROC), Mt. Katahdin Township (PVT), Oxbow Plantation (MFS), T3 R8 WELS (MFS), Trout Brook Township (UNH), Vassalboro (UNH).

**Genus *Sphaeroderus***

***Sphaeroderus canadensis canadensis* Chaudoir (Plate 43)**

Habitat: In deciduous or mixed forests, on sloping ground under stones and leaves.

Flight dynamics: Vestigially winged, flightless.

Biology: A snail eater, but preys on gypsy moth caterpillars when available. Teneral adults appear in late September but also in early May, but hibernation likely occurs only in the adult stage.

General range: A northeastern subspecies. Northeast to Nova Scotia and New Brunswick, in Québec north to Saguenay, in Ontario northwest to Newmarket, west to southeastern Michigan, Ohio, south to Tennessee and the Carolinas. Another subspecies (*Sphaeroderus canadensis lengi* Darlington) is found in the southern Appalachians.

Maine localities (16): Batchelders Grant Township (RENC), Caratunk (RENC), Carrabassett Valley (PVT), Gilead (CNC), Kibby Township (MFS), Monmouth (MFS), Mount Desert (PROC), Oxbow Plantation. (MFS), Sweden (CNC), T12 R7 WELS (MFS), T14 R6 WELS (MFS), T2 R4 WELS (CNC), T3 R8 WELS (MFS), T6 R11 WELS (UVM), Trout Brook Township (RENC), Winthrop (CNC).

***Sphaeroderus nitidicollis brevoorti* LeConte  
(Plate 43)**

**Habitat:** In deciduous forests on sloping ground under stones and leaves.

**Flight dynamics:** Vestigially winged.

**Biology:** A snail eater, but will prey on gypsy moth caterpillars when available. Teneral adults appear in late September, but also in early May, indicating hibernation may take place as either a mature larva or adult. Bousquet and Pilon (1980) reported, however, that in Québec the species lays eggs in the fall and that hibernation also can occur in the egg stage. It would seem that given the right conditions, adults can live multiple years, resulting in different stages of overwintering.

**General range:** A northeast and north-central North American species. Northeast to Nova Scotia and New Brunswick, in Québec northeast to Port-Cartier on north shore of the Gulf of St. Lawrence and north to Ft. Rupert on James Bay; in Ontario, north to Timagoni and Sioux Lookout, northwest to Lake Winnipeg in Manitoba, south to London, Ontario; in Québec south to Trois Rivières, Mont Tremblant, and Rigaud. In New England and New York, restricted to mountains and northern plateaus, in the White Mountains of New Hampshire, Green Mountains of Vermont, and the Adirondacks of New York. In Maine, found in cold, boggy areas near the eastern coast. Another subspecies (*Sphaeroderus nitidicollis nitidicollis* Guérin-Méneville) is found in Newfoundland and Anticosti Island, and in Québec on the mainland north of Anticosti; however, the only constant difference between them, according to Bousquet (2010), is size, with our subspecies ranging from 12.5–13.8 mm in length, and the nominate subspecies ranging from 14.1–17.8 mm.

**Maine localities (3):** Greenbush (MFS), Kibby Township (MFS), Lubec (PVT).

***Sphaeroderus stenostomus lecontei* Dejean  
(Plate 43)**

**Habitat:** Deciduous, mixed, and coniferous forests, forest edges, among shrubs along streams, in fence rows, in pastures during rainy weather.

**Flight dynamics:** Vestigially winged.

**Biology:** A snail eater. Mating occurs in early July, copulation averages 72 hours during which the female feeds; eggs are laid singly in isolated holes 2–12 mm deep in soil, but only in darkness; teneral adults appear from mid-August into September, and overwinter as adults. Adults are often active before snow melts in spring. During the spring thaw, adults may be found under flat stones that are warmed in the sun, but the rest of the year adults cling to under-

side of logs when they are tipped over; adults will stridulate or become motionless for up to 15 minutes if disturbed.

**General range:** A northeast-central North American species. Northeast to Newfoundland, in Québec north to Sept-Îles and Ft. Rupert on James Bay, in Ontario north to Rainy River, northwest to southeastern Saskatchewan, west to Montana, south to Missouri, Mississippi, Alabama, and Georgia. The nominate subspecies, *Sphaeroderus stenostomus stenostomus* (Weber), ranges from southern New York to North Carolina.

**Maine localities (66):** Augusta (MFS), Bar Harbor (UNH), Batchelders Grant Township (RENC), Beddington (MFS), Belgrade (RENC), Bethel (CNC), Bigelow Township (UVM), Brunswick (MFS), Byron (CNC), Camden (CNC), Cape Elizabeth (PVT), Carrabassett Valley (RENC), Carrying Place Township (MFS), Casco (PVT), Chain of Ponds Township (CNC), Chesterville (MFS), Durham (RPWC), Eustis (CNC), Fairfield (RENC), Fryeburg (CNC), Garland (RENC), Gilead (CNC), Gouldsboro (MFS, PROC), Hancock (CNC), Jackman (CNC), Kibby Township (MFS), Leeds (RENC), Lewiston (MFS), Milbridge (RENC), Mount Desert (PROC, UVM), Mount Katahdin Township (UNH), Mount Vernon (MFS, PVT), Nesourdnahunk Township (CNC), New Gloucester (PVT), Newry (CNC), Orono (MFS), Orrington (MFS), Oxbow Plantation (MFS), Phippsburg (RENC), Pittston (PVT), Presque Isle (MFS), Rangeley (MFS), Raymond (UVM), Reed Plantation (CNC), Seboomook Township (MFS), Sidney (RENC), Stoneham (RENC), T11 R10 WELS (MFS), T11 R7 WELS (MFS), T11 R8 WELS (MFS), T15 R8 WELS (MFS), T17 R4 WELS (MFS), T2 R9 WELS (RENC), T3 R8 WELS (MFS), T4 R10 WELS (CNC), T6 R11 WELS (UVM), T8 R14 WELS (PVT), Trout Brook Township (CNC, RENC), Vassalboro (PVT), Waterville (RENC), Weld (UVM), Wesley (MFS), West Forks Plantation (CNC), Winslow (PVT), Winthrop (CNC), York (PVT).

**Tribe Carabini**

**Genus *Calosoma***

***Calosoma calidum* (F.) (Plate 22)**

**Habitat:** In open areas often with herbaceous growth, open fields, roadsides, and sand pits.

**Flight dynamics:** Fully winged, in light trap records, strong flier, many northern records are strays beyond the breeding range.

**Biology:** Like other members of the genus, strictly predatory, particularly prone to eat caterpillars;

has been seen to escape by diving into water and swimming below the surface; chiefly active in twilight, sometimes also by day; has been observed to dig burrows beneath stones.

**General range:** A northern transcontinental species, but not quite reaching the Pacific coast. Northeast to northeastern New Brunswick (a single teneral male from French island of Miquelon, south of Newfoundland), in Québec on the Gaspé and Abitibi, in Ontario north to Attawapiskat River (52° N), in Manitoba north to Riding Mt. National Park, in Alberta north to Edmonton, in British Columbia northwest to Ft. St. John on the Peace River, west to the Cascade Range of Washington and Oregon, south to Utah, New Mexico, Kansas, Arkansas, Mississippi, Alabama, and Georgia.

**Maine localities (12):** Bath (MFS), Bingham (MFS), Calais (UVM), Columbia Falls (CNC), Ellsworth (MFS), Embden (RPWC), Kennebunk (MFS), Liberty (MFS), Milbridge (RENC), T19 MD BPP (MFS), Winter Harbor (PROC), Wiscasset (MFS).

#### ***Calosoma frigidum* Kirby (Plate 22)**

**Habitat:** A forest species, under dry leaves.

**Flight dynamics:** Fully winged, frequent flier.

**Biology:** Tree-climbing species of deciduous forests, forms concentrations at caterpillar outbreaks, e.g. of forest tent caterpillar (*Malacosoma disstria* Hübner) and maple prominent caterpillar (*Heterocampa guttivitta* Wlk.). Innumerable individuals arrive at twilight some evenings in June.

**General range:** A transcontinental species but not reaching the Pacific coast. Northeast to Cape Breton Island, in Québec north to Saguenay and Abitibi, in Ontario north to Lake Nipigon, in Alberta north to McMurray, in British Columbia north to Terrace (an isolated record), west to Utah, Colorado, south to Texas, Louisiana, Iowa, and Georgia. Some of the more distant records may represent strays rather than breeding populations.

**Maine localities (24):** Augusta (MFS), Bar Harbor (PROC), Big Six Township (MFS), Bremen (UNH), Bridgton (MFS), Dixmont (MFS), Frenchtown Township (MFS), Fryeburg (MFS), Lincoln (MFS), Lubec (RPWC, RENC), Mount Vernon (MFS), Newburgh (MFS), Northeast Carry Township (PVT), Patten (UNH), Pierce Pond Township (MFS), Pittston (PRF), Rangeley (MFS), Raymond (UVM), Skowhegan (MFS), Steuben (MFS), T34 MD (MFS), T6 R11 WELS (UVM), TA R11 WELS (MFS), Waterboro (RENC).

#### ***Calosoma scrutator* (F.) (records from Majka et al. (2011)) (Plate 22)**

**Habitat:** Deciduous forests and forest margins, as well as cultivated fields with dense vegetation.

**Flight dynamics:** Fully winged, frequently found in wind-drift material and occasionally attracted to artificial lights (sometimes in large numbers).

**Biology:** Egg-laying takes place in June to early July. Adults enter diapause in late summer as principal prey (lepidopteran larvae) emerge as adults; adults overwinter and apparently commonly live two years.

**General range:** Occurs in the USA east of the Rocky Mountains as well as in California; northeastern limit in Nova Scotia, New Brunswick, Ontario, and Québec, south to Florida, Texas, and Arizona.

**Maine localities (2):** Skowhegan (PVT), Waterville (PVT)

#### ***Calosoma sycophanta* L. (Plate 22)**

**Habitat:** Deciduous forests.

**Flight dynamics:** Fully winged, strong climber and flier.

**Biology:** The adults feed on caterpillars; it is thought to be more effective at control than native members of the genus, because the beetle larvae as well as adults climb.

**General range:** An Old World species, deliberately introduced into New England in the early 20th century for controlling the gypsy moth (*Lymantria dispar* L.) and the browntail moth (*Euproctis chrysorrhoea* (L.)). It was later introduced into Washington, Michigan, New York and New Jersey. Unsuccessful attempts were also made, without success, in Nova Scotia and British Columbia. In the Old World from the temperate parts of Europe, western Siberia and North Africa, in the Caucasus and Persia. Stray specimens get to the British Isles and Scandinavia

**Maine localities (7):** Augusta (MFS), Kennebunk (MFS), Orono (MFS), South Berwick (MFS), Standish (MFS), Vassalboro (MFS), Winter Harbor (PROC).

#### **Genus *Carabus***

##### ***Carabus auratus auratus* L. (Plate 22)**

**Habitat:** In the USA, a strongly synanthropic species which thrives in croplands and gardens.

**Flight dynamics:** Vestigially winged.

**Biology:** In Europe, there are many observations of it climbing in trees, but this has not been observed in New England. It is found beneath cover in gardens, or in moist grasslands. Many have been found trapped in storm sewers.

**General range:** An Old World species, introduced. In the Old World, a limited range in Europe from France and Germany to northern Spain, east to Poland. Reports from Moscow, southern Scandinavia, and the British Isles are probably introduced and not established populations. It

was deliberately introduced into the New World near Boston in 1908–1910 in an attempt to control the gypsy moth. It has spread to the other New England states, but not beyond.

**Maine localities (14):** Bangor (MFS), Brewer (MFS), Burnham (PVT), Clinton (PVT, RENC), Cumberland (MFS), Newport (PVT), Old Town (MFS), Orono (MFS), Pittsfield (UNH), Portland (UNH), Sidney (PVT, RENC), Smithfield (RENC), Troy (MFS), Windsor (MFS).

***Carabus chamissonis* Fischer von Waldheim (Plate 22)**

**Habitat:** Generally in open, dry country, particularly the tundra in northern Canada and Alaska, especially on well-drained substrates such as sandy areas or rocky slopes.

**Flight dynamics:** Vestigially winged, flightless.

**Biology:** Mature larvae seen in mid-July (in Labrador) and a teneral adult at Mt. McKinley in Alaska in the middle of August. Nocturnal, but by day adults may be found under stones.

**General range:** A northern transcontinental species. Across northern Canada and Alaska in the tundra zone, including at least southern Victoria Island in Nunavut, but not reaching the Arctic coast in Alaska. In the interior of the continent, extending well south into the taiga zone. In Edmonton, Alberta, relict populations occur in deep ravines. Apparently absent from the west coast area of heavy rainfall. In the east, south to the Straits of Belle Isle. There are relict populations in the mountains of the Gaspé Peninsula and above treeline in the Presidential Range of New Hampshire, though not at the very summit of Mt. Washington – apparently not above Nelson Craggs.

**Maine localities (1):** Mt. Katahdin Township (MFS).

***Carabus goryi* Dejean (Plate 22)**

**Habitat:** Deciduous forest.

**Flight dynamics:** Vestigially winged.

**Biology:** Nocturnal, adults especially active in spring, most specimens are caught in pitfall traps. A fast runner, rarely under superficial cover.

**General range:** A northeastern and central North American species. Northeast to Maine, north to Vermont and New York, southern Ontario near Windsor, Michigan, Wisconsin, northwest to Minnesota, west to Iowa, Illinois, south to Tennessee, Alabama, and Georgia.

**Maine localities (2):** Bar Harbor (PROC), Southport (MFS).

***Carabus maeander* Fischer von Waldheim (Plate 22)**

**Habitat:** In swampy spots with cattails or sedges and wet meadows.

**Flight dynamics:** Vestigially winged.

**Biology:** Active by day in early spring after snow melt. At this time, they wander and are found crossing roads or in pastures. A good swimmer, has been seen to hide under floating vegetation, where it was submerged up to 10 minutes, also has been seen to protrude its abdomen above surface to get air. It has been observed climbing sedge stems. Hibernates as adult, teneral adults appear in early May.

**General range:** A Holarctic species. In the Old World, in central and eastern Siberia and in Japan. In North America, northeast to Newfoundland and Labrador, in Québec north to Saguenay, in Ontario and Manitoba north to Hudson Bay, in the Northwest Territories, north to Ft. Good Hope near the Arctic Circle, in Alaska northwest to the Seward Peninsula and Kodiak Island, in British Columbia, limited to the northeast, south to Montana, South Dakota, Iowa, northern Illinois, Pennsylvania, northern New York, and Vermont.

**Maine localities (6):** Bar Harbor (UNH), Clinton (RENC), Dennysville (UNH), Fairfield (PVT), Mount Desert (PROC, UVM), New Gloucester (PVT).

***Carabus nemoralis* Müller (Plate 22)**

**Habitat:** Strongly synanthropic, it has been able to reach the fields and gardens of even the most isolated farms. Increasingly being found in more natural habitats – moist to wet deciduous forest, especially on river floodplains or adjacent to wetlands. Reportedly more common in North America than in Europe.

**Flight dynamics:** Vestigially winged.

**Biology:** The adults overwinter. In spring, they are commonly seen crossing sidewalks, sometimes numbers of them are unearthed in spading garden plots. Larvae may be abundant in garden soil in late spring. In Europe, the adult has been observed climbing trees, but there are no reports of this in America. Adults feed heavily on introduced garden slugs, probably controlling their population, and on earthworms (most species are also introduced). It has been reported that in June the females respond to both earthworms and slugs but the males only respond to earthworms; larvae feed on earthworms. Adults can also be found on damaged fruit, e.g., bruised strawberries.

**General range:** An Old World species, introduced on both coasts. Date of introduction before 1870 in eastern Canada. It was intentionally introduced into the Boston area around 1910 in an attempt to control the gypsy moth. On the West Coast, it was introduced before 1909 in the Puget Sound area. In the Old World,

found in the temperate zone of Europe from southern Scandinavia, British Isles, south to northern Spain and Italy, through Poland and Russia, in the temperate part of western Siberia east to Novosibirsk, introduced into southern Kazakhstan. In Canada and the USA, it is now widespread, but it is absent from the arid Southwest, the Great Plains, and the Southeast states. Northeast to Newfoundland, in Québec north to the North Shore, Chicoutimi, and Ile d'Anticosti. Probably across Canada unless there is a gap north of Lake Superior. On the West Coast, from Prince Rupert, British Columbia, south to San Francisco, in the Rocky Mountain states south to Cheyenne, Wyoming; south to Minnesota, Illinois, Ohio, and Virginia.

**Maine localities (40):** Bar Harbor (PROC), Belgrade (RENC), Brunswick (MFS), Castine (PVT), Clinton (RENC), Corinna (RENC), Cumberland (RENC), Ellsworth (MFS), Fairfield (RENC), Fort Kent (MFS), Freedom (MFS), Garland (RENC), Gorham (UVM), Islesboro (PVT), Kennebunk (UNH), Lee (RPWC), Lewiston (MFS), Liberty (MFS), Millbridge (MFS, RENC), Monhegan Island Plantation (UVM), Monmouth (MFS), Mount Vernon (MFS), New Vineyard (RENC), Newport (RENC), Oakfield (PVT), Orono (MFS), Portage Lake (MFS), Rangeley (PVT), Rockland (MFS), Sanford (UVM), Squapan Township (CNC), Steuben (MFS), Tremont (RENC), Trout Brook Township (RENC), Unity (PVT), Upton (CNC), Vassalboro (PVT), Washburn (RENC), Waterville (RENC), Wilton (CNC).

***Carabus serratus* Say (Plate 23)**

**Habitat:** Dry, open or partly shaded areas such as gravel pits, railway embankments, thin forest on rock pavements and edges of talus.

**Flight dynamics:** Dimorphic, fully winged form rare, once collected on the summit of Mt. Washington to where it presumably flew.

**Biology:** Nocturnal, hibernates as an adult.

**General range:** A transcontinental species. Northeast to Newfoundland, in Québec on the North Shore and north to Abitibi, in Ontario north to Nipigon, in the prairies north to Saskatoon, Saskatchewan and McMurray, Alberta, west to the Okanagan Valley in British Columbia, eastern Washington and Oregon, south to Idaho, Montana, New Mexico, Kansas, Illinois, Indiana, Ohio, West Virginia, South Carolina, and Georgia.

**Maine localities (9):** Bar Harbor (PROC, UNH, MFS), Boothbay (UNH), Clinton (RENC), Fairfield (RENC), Lubec (MCZ), Mount Desert

(MCZ, PROC), New Gloucester (PVT), New Sharon (RENC), Northeast Carry Township (MCZ).

***Carabus sylvosus* Say (Plate 23)**

**Habitat:** Deciduous woods, second-growth mixed forest, jack pine forest, and oak-hickory forest, and in adjacent clear cuts.

**Flight dynamics:** Wings vestigial.

**Biology:** Unknown.

**General range:** An eastern and central North American species. Northeast to western Maine, in Québec from Hemmingford in the southwest corner, in Ontario, Belleville, and Gogama (a far northern isolated population, but nevertheless, abundant), northwest to Wisconsin, west to Iowa, Kansas, Oklahoma, an isolated record from Utah, southwest to Texas, south to Arkansas, Alabama, and Florida.

**Maine locality (1):** Norway (CNC).

**Subfamily Cicindelinae**

**Tribe Cicindelini**

**Genus *Cicindela***

***Cicindela ancocisconensis* Harris (Plate 24)**

**Habitat:** Adults found on clean sand deposits along rivers, especially on point bars, but often where there is cobble gravel nearby. Adults may be found close to water's edge, but the larval burrows are well back from the shore and located where only the highest floods would inundate them.

**Flight dynamics:** Like all *Cicindela* L., hind wings are fully developed, and the beetle can take flight while running. A day flier using flight to escape predators and for foraging.

**Biology:** Has a two-year life cycle. Old adults breed in the spring and new adults appear in August, the latter feed in the fall then hibernate. The species often occurs with *C. repanda* Dejean. When escaping, it flies higher, farther, and straighter than *C. repanda*.

**General range:** An Appalachian species. The historical range of this species was northeast to the Gaspé of Québec, southeast of the St. Lawrence River, New York state, northeastern Ohio to Cleveland, south along the Appalachians to northern Georgia, eastern limit followed the edge of the Appalachians from Georgia to Pennsylvania and New York, in northwest Massachusetts and across New Hampshire. There possibly is a disjunct area occupying Indiana north of the Wabash River and extending west to Chicago and another in the unglaciated area of Indiana, from Bloomington south. Some entomologists doubt the authenticity

of the Illinois and Indiana specimens. The species seems to be disappearing, likely due to loss of habitat. Surviving populations are in New Brunswick, Québec in the Gaspé area, and in a number of localities on the Nicolet, Bécancour, and Chaudière Rivers. In Maine at Farmington on the Sandy River, one locality in Vermont, and several areas in the White Mountains of New Hampshire and adjacent Maine. Populations also survive in Pennsylvania, Maryland, West Virginia, Virginia, and North Carolina.

Maine localities (3): Batchelders Grant Township (RENC), Farmington (RENC), Fryeburg (MCZ, PVT); state record only (MCZ).

***Cicindela duodecimguttata* Dejean (Plate 24)**

Habitat: On sandy or clay soil, abundant near rivers but also found on disturbed places such as logging roads, gravel banks, sand and gravel pits, eroded fields, and cranberry bogs.

Flight dynamics: Fully winged, day flier, can take flight when running.

Biology: Larval burrows in steep clay or sand banks. In the north, the species has a typical two-year life cycle, spending the first winter as a full-grown third instar and the second winter as an adult. Mating and oviposition are in May and June. Adults have been observed to feed on dead insects in shore drift and to capture small flies and pygmy mole crickets (Tridactylidae).

General range: An east-central species, west only to the Rocky Mountains. Northeast to Newfoundland and central Labrador, in Québec north to James Bay, in Manitoba north to the north end of Lake Winnipeg, in the Northwest Territories north to Great Slave Lake, from the Peace River of British Columbia to eastern Colorado, south to Texas, northern Louisiana, northern Alabama, and northern Georgia, in the southeastern states largely absent from the coastal plain.

Maine localities (48): Ashland (PVT), Athens (RENC), Bancroft (CNC), Bar Harbor (PROC, PVT, MFS), Brownville (PVT), Buckfield (PVT), Caratunk (RENC), Clinton (RENC), Comstock Township (RPWC), Edinburg (PVT), Fort Kent (PVT), Garfield Plantation (MFS), Gilead (RENC), Glenwood Plantation (PVT), Greenville (MCZ, PVT), Jackman (PVT), Long Pond Township (CNC), Mercer (PVT), Monmouth (MCZ, PVT), Mount Desert (PROC, PVT, MFS), Mount Katahdin Township (PVT), Newry (CNC), Norridgewock (PVT), Norway (MCZ, PVT), Orono (PVT), Orrington (MFS, RENC), Paris (MCZ), Rangeley (PVT, MFS), Rockwood Strip T1 R1 NBKP (PVT), Roque Bluffs (PVT), Sandy River Plantation (RENC), Shawtown Township (MFS), South-

west Harbor (MCZ), Steuben (UVM), Strong (RENC), T14 R15 WELS (CNC), Cathance Township (RPWC), T2 R9 WELS (RENC), T3 R11 WELS (RENC), T3 R8 WELS (RENC), T4 R10 WELS (RENC), T5 R9 WELS (MFS), T6 R12 WELS (RPWC), T6 N of WELD (MFS), Upton (PVT, MFS), Wales (PVT, MFS), Waterboro (RENC), Wells (MCZ), Weston (CNC).

***Cicindela formosa generosa* Dejean (Plate 24)**

Habitat: Loose sand areas away from water; dunes, blowouts and sand pits, often with sparse grasses.

Flight dynamics: Fully winged, a day flier, makes longer escape flights than other species.

Biology: A two-year life cycle species. Both old and new adults are present together in mid-summer, oviposition in May and June, third instar in September overwinter, appear as larvae again in spring, pupate in June-July, some adults emerge in fall, others go straight into hibernation, mating in May. Adults burrow for shelter; the burrow has a flattened, oval opening. The larval burrow is mainly vertical, but the uppermost part curves to become horizontal and opens into a small pit. The sand around the entrance is cemented by a secretion of the larva. The adult makes a loud buzzing noise in flight.

General range: An eastern subspecies. Northeast to Labrador, in Québec north to Port-Neuf, west to Manitoba, and in the USA west to Wisconsin, Iowa, Missouri, and Arkansas, south to Louisiana, Mississippi, Tennessee, and Virginia. It is absent from the coastal plain in the southeastern states and from Maritime Canada except for Nova Scotia. Represented by four other subspecies in the prairie provinces, the Great Plain states, and Texas.

Maine localities (28): Augusta (PVT, MCZ), Bigelow Township (UVM), Bingham (PVT, RENC), Embden (PVT), Fairfield (RENC), Farmington (PVT), Fayette (PVT), Freeport (MCZ), Fryeburg (PVT, RPWC), Greenville (PVT), Milo (PVT), New Portland (PVT), Norridgewock (RENC), Norway (MCZ), Ogunquit (PVT, RENC), Old Orchard Beach (PVT, MCZ), Old Town (PVT), Orono (MFS, PVT), Paris (MCZ), Portland (MCZ), Rangeley (PVT), Salem Township (MCZ), Sidney (PVT), South Berwick (MCZ, PVT), Wells (PVT), West Paris (MFS), Windham (PVT), Winslow (RENC).

***Cicindela hirticollis rhodensis* Calder (Plate 24)**

Habitat: In Maine, it is found on higher portions of sandy beaches along the sea coast, generally in less-vegetated areas than *C. formosa generosa*, but overlapping with this species.

Flight dynamics: Fully winged, a frequent flier.

Biology: Two-year life cycle, eggs laid in June-July, larvae reach the third instar stage by September - October, and overwinter in the burrow; the larva pupates in midsummer the following year, and adults emerge in August but do not breed until the next year. The larval burrow is normally vertical and 12 cm deep.

General range: A northeastern subspecies. Northeast to Newfoundland and Labrador, in Québec along all the big rivers and some lakes, west through Ontario to Michigan, south to New York, east to the Atlantic Coast from Rhode Island northward including Cape Breton Island, Prince Edward Island, and Sable Island. Nine other subspecies are found over most of the rest of the USA (excepting the Great Basin), including western Texas, southern Florida, and across most of southern Canada. This species has disappeared in many areas due to overuse of beaches, dam construction on big rivers, and overuse of insecticides.

Maine localities (10): Freeport (MCZ), Georgetown (MFS), Kennebunk (PVT), Kennebunkport (UVM), Lubec (RENC), Ogunquit (MCZ, PVT), Old Orchard Beach (MCZ, PVT), Phippsburg (RENC), Scarborough (PVT, RENC), Wells (MCZ, PVT, UNH).

#### ***Cicindela limbalis* Klug (Plate 24)**

Habitat: Sloping clay banks, road cuts, and eroded fields.

Flight dynamics: Fully winged, frequent flier.

Biology: Two-year life cycle, eggs laid in June, overwinters in last instar, pupates in July, some adults emerge and hunt, others only emerge the following spring. The opening of the larval burrow extends into a small chimney. The outer part of the burrow is perpendicular to the surface and the burrow becomes horizontal at the inner end.

General range: A widespread species from the Atlantic Coast west to and including the Rocky Mountains. Northeast to Newfoundland, in Québec north to the North Shore and Abitibi, in Ontario north to Smoky Falls on the Mattagami River and Sioux Lookout, in Manitoba north to Southern Indian Lake, in Saskatchewan north to Reindeer Lake, in the Northwest Territories on the Mackenzie River at Ft. Norman, west to the Rocky Mountains in eastern British Columbia; in the USA, most of Montana and Wyoming, in Colorado most of the state including area west of the Rockies, extreme eastern Utah, south to extreme northern New Mexico, northern Kansas and Missouri, western and northern Illinois, northern Indiana and Ohio, Pennsylvania, New Jersey, and Connecticut.

Maine localities (30): Addison (RPWC), Augusta (PVT), Aurora (MFS), Bar Harbor (PROC, PVT), Berwick (PVT), Boothbay Harbor (PVT), Bremen (PVT), Brewer (PVT), Bristol (PVT), Brooklin (PVT), Camden (PVT), Clinton (PVT), Edmunds Township (PVT), Fairfield (RENC), Freeport (MFS), Lamoine (MCZ), Machias (PVT), Madison (PVT), Monmouth (MCZ, PVT), Mount Desert (MCZ, MFS, PVT), New Portland (PVT), Orono (PVT), Shawtown Township (MFS), Southwest Harbor (PROC), Waterville (PVT), Wells (MCZ), Winslow (PVT).

#### ***Cicindela longilabris longilabris* Say (Plate 25)**

Habitat: On bare soil in northern sites, generally in conifer-dominated forest, on dirt roads, disused lumber roads, trails, paths, and on scree slopes and rock ledges; has been taken near the summit of Mt. Washington, New Hampshire.

Flight dynamics: Fully winged, frequent flier.

Biology: Three-year life cycle. First instar lasts 2-4 weeks in July, second instar from August onward; it overwinters in this stage, and the third instar develops the following June, overwinters again, then pupates in July. Adults appear in August and overwinter in this stage, breeding and egg-laying take place in the following spring.

General range: A northern nearly transcontinental subspecies. Northeast to Newfoundland and Labrador, in Québec north to Opinaca River mouth at Hudson Bay, in Ontario north to Hudson Bay, in the Northwest Territory north to Norman Wells on the Mackenzie River, in Yukon north to Old Crow on the Porcupine River beyond the Arctic Circle, west to Fairbanks, Alaska and the eastern side of the Coast Range in British Columbia, south to central Saskatchewan and to southern Manitoba, northwestern Minnesota, Wisconsin south to Green Bay, northern Michigan, south to Traverse City, in Ontario south to the Bruce Peninsula, Lake Simcoe and Cornwall, south in Québec to Rigaud, La Trappe, and the lowlands along the St. Lawrence River, south of the river in a narrowly isolated area including the Gaspé, the Maritime provinces, the higher parts of the eastern townships and northern Maine, extreme northern New Hampshire and northeastern Vermont, isolated populations occur in the Adirondacks, and higher mountains of Vermont and New Hampshire. Two other subspecies (*Cicindela longilabris laurentii* Schaupp and *Cicindela longilabris perviridis* Schaupp) occur in the Rocky Mountains, the Cascades, and the Sierra Nevada of California.

Maine localities (23): Bar Harbor (PROC, PVT), Bigelow Township (UVM), Boothbay Harbor

(MCZ), Brooksville (MCZ), Edmunds Township (PVT, UNH), Eustis (PVT, UVM), Grand Lake Stream Plantation (MCZ), Greenfield Township (PVT), Greenville (PVT), Katahdin Iron Works Township (PVT), King and Bartlett Township (PVT), Lincoln (MFS), Lincoln Plantation (RPWC), Machias (PVT), Mount Desert (MCZ, PVT), Southwest Harbor (PVT), T1 R9 WELS (RPWC), T2 R9 WELS (RPWC), T3 R11 WELS (RENC), Tremont (PVT), Trout Brook Township (RENC), Upton (MFS), Weld (MCZ).

***Cicindela marginata* F. (Plate 25)**

**Habitat:** Found where dunes border salt marshes and on saline mud or tidal flats, almost invariably on damp, near-horizontal surfaces.

**Flight dynamics:** Fully winged, a quick and frequent flier.

**Biology:** Adults can be abundant in late June to early July; partly nocturnal, comes to lights. The life history of this species is poorly documented and little is known about its biology. It is usually solitary, very wary, and hard to catch.

**General range:** An eastern coastal species ranging from southern Maine south along the coast to Apalachee Bay, Florida on the Gulf of Mexico; also found in Cuba and the Bahamas.

**Maine localities (5):** Georgetown (MFS), Kennebunk (PVT), Ogunquit (MCZ, PVT), Phippsburg (PVT), Wells (MCZ, PVT).

***Cicindela marginipennis* Dejean (Plate 25)**

**Habitat:** Relatively high, seasonally flooded and scantily vegetated cobble-gravel bars and islands in larger rivers. Flooding by dam construction and other habitat destruction has made this beetle rare over most of its range, and it is considered threatened or endangered in most areas where found. Only discovered at one site in Maine in 2009, and a candidate for threatened/endangered status.

**Flight dynamics:** Fully winged, flies readily.

**Biology:** Unknown, but likely similar to other species in the state, with a two-year life cycle and overwintering in both larval and adult stages.

**General range:** Mississippi and Alabama north-eastward to Ohio, Indiana, New York, and Maine, and across the border to sites along the St. John River and at Grand Lake in New Brunswick.

**Maine locality (1):** N. Anson (MIFW)

***Cicindela punctulata* Olivier (Plate 25)**

**Habitat:** Common species of dry, bare soil, including worm spots in dirt paths in grass areas, bare soil of croplands and gardens, road cuts, eroded areas, gravel pits, and even on city sidewalks, but generally not on extensive sandy areas

without finer (silty or clay) substrates nearby. The larva is tolerant of different soil types but is a specialist in burrowing in hard, compacted soils as in paths and dirt roads.

**Flight dynamics:** Fully winged, day flier.

**Biology:** A one-year life cycle, differing from the other Maine species in that the adult does not hibernate, mating and egg-laying in late July, larva reaches third instar by September and hibernates, larva feeds until June of following year when it pupates, adults emerge in July. It has been observed climbing and perching on grass stalks. It comes to light at night and various observers have noticed its defensive secretion smells like apples.

**General range:** A widespread species except for the Pacific coastal states and northern Rockies. Northeast to New Brunswick, in Québec in the eastern townships east to Sherbrooke and northeast on the St. Lawrence River to Portneuf; the northern limit west of Montreal is about 100 km north of the Ottawa River near Nomingue, in Ontario north to Georgian Bay, Lake Huron, Lake Superior, and Lake of the Woods. Found north of the international boundary across the prairie provinces; the western limit north of 41° N is formed by the eastern edge of the Rocky Mountains, south across Montana and Wyoming, south of the 41<sup>st</sup> parallel it lies west of the Colorado River drainage extending to Great Salt Lake and Utah, south to the southern tip of Nevada, west to northern and eastern Arizona, extending south into Mexico, apparently absent from lower Rio Grande valley in Texas, otherwise south to the Gulf of Mexico and into Florida (except the southernmost tip).

**Maine localities (18):** Arundel (MFS), Augusta (RENC), Belgrade (PVT), Fairfield (RENC), Farmington (PVT), Fryeburg (RPWC), Kennebunk (MFS), Lewiston (PVT), Mechanic Falls (RENC), Mexico (PVT), Norridgewock (RENC), Norway (MCZ), Paris (MCZ), Scarborough (RENC), Wales (PVT), Waterboro (RPWC, RENC), Waterford (RENC), Waterville (RENC), Woodstock (PVT).

***Cicindela purpurea* Olivier (Plate 25)**

**Habitat:** Bare spots in grassy fields, typically on cow paths and ruts of seldom-used roads, it can be in old sand pits, but usually on clay-rich or silty ground rather than more sandy substrates.

**Flight dynamics:** Fully winged, day flier.

**Biology:** A two-year cycle species. Adults are among the earliest tiger beetles active in the spring, appearing as early as late April in Vermont and Maine and as early as late March

in southern New Hampshire; mating and egg-laying come soon after emergence, larvae reach third instar by fall, feed the following spring, pupate in July and new adults appear in August, but do not breed until the following spring. The adults are adapted to relatively low temperatures; in cool, sunny weather in mid-May, they will be the only ones active in the morning, while *Cicindela tranquebarica* Herbst at the same site was active in the warmest part of the afternoon. It has been seen landing on snow patches in April. The larval burrow is the usual vertical type, unlike that of *C. limbalis*.

**General range:** A transcontinental species. Northeast to New Brunswick, in Québec northeast along St. Lawrence River to Québec City, west along the Ottawa River, west to Lake Superior, in the southern prairie provinces, south-central British Columbia, in Puget Sound and Willamette valleys, south to Sierra Nevada of California and Nevada, south through Utah to eastern Arizona and western New Mexico, south to the Texas panhandle, northern Arkansas, northern Mississippi, Georgia, North and South Carolina. In North Carolina, Virginia, and Maryland, it is absent from the coastal plain.

**Maine localities (28):** Argyle Township (PVT), Augusta (PVT), Aurora (MFS), Bar Harbor (PROC), Bethel (MCZ), Blue Hill (RENC), Bristol (PVT), Brunswick (MCZ), Clinton (RENC), Fairfield (RENC), Grafton Township (PVT), Greenbush (PVT), Limerick (CNC), Madison (PVT), Monmouth (MCZ), Mount Desert (PVT), Mount Vernon (MCZ), Newcastle (PVT), Norway (MCZ), Old Town (UVM), Orono (PVT, UVM), Paris (MCZ), Shapleigh (RPWC), Sidney (PVT, RENC), Vassalboro (RENC), Waterville (PVT), Weld (MCZ), Winthrop (PVT).

***Cicindela repanda repanda* Dejean (Plate 25)**

**Habitat:** On sand bars along rivers and dirt roads through sandy fields near rivers, sometimes amazingly abundant. Also in sand pits which are damp. Stray migrants are found on mountain tops.

**Flight dynamics:** Fully winged, day flier.

**Biology:** A two-year life cycle. The larva lives in an oblique burrow about 10 cm deep, amid scattered vegetation. Eggs are laid in May and June, larvae overwinter in third instar, new adults emerge in summer but do not breed until the following year.

**General range:** Nearly transcontinental but not quite reaching the Pacific coast. Northeast to Newfoundland and central Labrador, north to Hudson Bay and northern Alberta, west to

central British Columbia and Arizona, south to Texas and Florida.

**Maine localities (41):** Abbot (RENC), Argyle Township (PVT), Arundel (MFS), Biddeford (MFS), Brooksville (PVT), Clifton (PVT), Clinton (PVT), Comstock Township (RPWC), Fairfield (PVT), Farmington (RENC), Fryeburg (PVT), Gilead (RENC), Mount Desert (MCZ, PROC, PVT), Mount Katahdin Township (PVT), New Sharon (RENC), Newcastle (PVT), Norridgewock (RENC), Ogunquit (MCZ), Old Town (PVT), Orono (PVT), Orrington (MFS), Paris (MCZ, PVT), Phillips (PVT), Rockwood Strip T1 R1 NBKP (PVT), Saint Francis (PVT), Scarborough (PVT), Sidney (RENC), Skowhegan (PVT, RENC), South Berwick (MCZ, PVT), Steuben (UVM), Strong (RENC), Turner (MCZ), Vassalboro (PVT), Veazie (PVT), Waldoboro (PVT), Washington (RENC), Waterboro (RPWC), Weld (MCZ), Wells (PVT), Winslow (PVT), Woodstock (PVT).

***Cicindela scutellaris lecontei* Haldeman (Plate 25)**

**Habitat:** Loose dry sand away from water, dunes, sand pits, and blowouts. Usually associated with *C. formosa generosa* in non-coastal settings.

**Flight dynamics:** Fully winged, day flier.

**Biology:** Has a two-year life cycle. Adults which have overwintered are present from early May to late June in northern Vermont; third instars overwinter, feed through the next summer, and become adults in September, then are active while the warm weather lasts into October. These individuals do not breed until the following spring. The larval burrow is a vertical shaft 30–55 cm. deep. Adults are moderate fliers but are especially wary and not easy to catch, though they often do not fly far once taken to wing. When handled, they emit a defensive secretion which smells like apples.

**General range:** A Midwestern species with a northeastern extension reaching Atlantic Coast. Six other subspecies are found on the Atlantic coast from Massachusetts south to Florida, along the Gulf Coast and Mississippi Valley and west into Texas and Colorado, and the Great Plains north to Alberta. *Cicindela scutellaris lecontei* is found northeast to central Maine, in Québec north to Québec City, in Ontario along the Ottawa River and to Muskoka District at Georgian Bay, north to northern Michigan, northern Minnesota, northwest to eastern North Dakota, west to eastern Nebraska and Kansas, south to Missouri, Illinois and western Ohio, western part of West Virginia, northwestern Pennsylvania, most of New York state except for lower Hudson and Long Island regions, northern Connecticut, and western Massachusetts.

Maine localities (13): Belgrade (PVT), Clinton (PVT), Embden (PVT), Fairfield (RENC), Fryeburg (RPWC), Mechanic Falls (RENC), Sanford (CNC), Skowhegan (PVT, RENC), South Berwick (PVT), Washington (RENC), Waterboro (RPWC), Wells (RENC), Winslow (PVT, RENC).

***Cicindela sexguttata* F. (Plate 25)**

Habitat: In most of its range, it is a forest and forest-edge species, commonly seen on old lumber roads, trails, and blowdowns. In northern New England, it can be found in more open situations such as parks and gardens.

Flight dynamics: Fully winged, day flier.

Biology: A two-year life cycle, predominantly a spring-fall species and relatively uncommon in mid-summer. Eggs are laid in June and July, and larvae reach third-instar status in fall and then overwinter; pupation occurs in midsummer the following year, becoming adults in late summer, but they normally do not emerge until the following spring. Larvae make their burrows at spots where the soil is exposed, such as bases of windthrown trees, edges of trails, and small eroded gullies. Larvae have also been found in partly shaded sections of vegetable gardens, preying on ants. The adult does not make dashes while hunting like other tiger beetles but tends to sit and wait in flecks of sunlight on the forest floor, where it ambushes incoming insects. Disturbed adults follow a curved flight path, often alighting in or on vegetation. An adult has been observed foraging on floating water lily leaves. In early spring, this tiger beetle is often found beneath loose bark or under flat stones when the air temperature is low but the sky is clear, sunny, and bright; can often be found in the same settings on overcast days later in summer. The stones or bark are heated by the sun and beetles are “basking” under the stones, thus raising body temperature.

General range: An eastern species. Northeast to New Brunswick, in Québec north to the Saguenay River, in Ontario north to Georgian Bay, in Michigan north to Lake Superior, Northwest to northern Minnesota and southeastern North Dakota, west to the east edge of the Great Plains, through South Dakota, Kansas, Oklahoma, and Texas, south to eastern Texas, Louisiana, and northern Florida.

Maine localities (52): Addison (RPWC), Alna (PVT), Argyle Township (PVT), Athens (RENC), Augusta (MFS, PVT), Bangor (PVT), Bar Harbor (MFS, PROC, PVT), Belgrade (RENC), Benton (RENC), Bethel (MCZ), Brooksville (MCZ), Chesterville (UVM), Clinton (RENC), Edgecomb (PVT), Edmunds Township (PVT), Ellsworth (MFS), Fryeburg (RPWC), Gouldsboro

(PVT), Greenwood (PVT), Hartland (RENC), Katahdin Iron Works Township (PVT), Lewiston (MFS), Lincoln (PVT), Lincolnville (PVT), Monmouth (MCZ, PVT), Mount Desert (PVT), Mount Vernon (MFS), New Sharon (RENC), Newcastle (PVT), Newfield (RPWC), Norridgewock (RENC), Old Town (PVT), Orono (MFS, PVT), Paris (MCZ, PVT), Parsonsfield (RPWC), Saco (PVT), Sidney (RENC), Skowhegan (RENC), Steuben (PVT), T1 R9 WELS (RPWC), Troy (RENC), Vassalboro (RENC), Veazie PVT), Waldoboro (MCZ), Wales (MCZ, PVT), Waterford (RPWC, RENC), Waterville (RENC), Weld (MCZ), Windsor (RENC), Winthrop (MCZ, PVT), Woolwich (MFS), York (MCZ, PVT, RENC, RPWC).

***Cicindela tranquebarica tranquebarica* Herbst (Plate 25)**

Habitat: Sand pits, gravel pits, roadsides, dunes, and eroded sloping clay banks.

Flight dynamics: Fully winged, day flier.

Biology: A two-year life cycle species. Adults appear early in the spring for egg-laying, larvae reach third instar by fall, overwinter, and pupate the following summer. The larval burrow is straight, 9–20 cm deep. Adults stridulate occasionally.

General range: A nearly transcontinental species not reaching the west coast. Northeast to southwestern Newfoundland, in Québec north to the North Shore and James Bay, northern limits uncertain in Ontario, in Manitoba north to Gillam on the Nelson River, in the Northwest Territories, north to Great Slave Lake, west to the northern Rockies, Alberta, Montana, and Wyoming, west to eastern Colorado, south to the panhandle of Texas and east Texas, south nearly to the Gulf of Mexico, in northern Louisiana, Mississippi, and Alabama, southeast to central Georgia and the southern tip of South Carolina. Other subspecies occupy the area west of the Rockies, including the Great Basin, eastern Washington and Oregon, and the foothills of California.

Maine localities (45): Albion (RENC), Argyle Township (PVT), Bangor (PVT), Bar Harbor (PVT), Bigelow Township (UVM), Chester (PVT), Columbia Falls (PVT), Eastport (PVT), Fairfield (RENC), Fort Kent (PVT), Fryeburg (PVT), Greenbush (PVT), Greenfield Township (PVT), Greenville (PVT), Guilford (PVT), Kennebunk (MCZ), Lamoine (PVT), Lincoln (PVT), Lincoln Plantation (RPWC), Lincolnville (PVT), Lubec (PVT), Madison (PVT), Magalloway Plantation (RPWC), Mayfield Township (RENC), Mercer (MCZ), Monmouth (MCZ), Mount

Desert (MCZ, PROC, PVT), Mount Katahdin Township (MCZ, PVT), Newcastle (PVT), Norway (MCZ), Ogunquit (MCZ, PVT), Old Town (PVT), Orono (MFS, PVT), Paris (MCZ), Readfield (PVT), Rockwood Strip T1 R1 NBKP (PVT), Roque Bluffs (PVT), Rumford (PVT), Sanford (CNC), South Berwick (MCZ, PVT), Steuben (UVM), Wales (MCZ), Waterville (PVT), Wells (MCZ, PVT), Wilton (CNC).

### Subfamily Loricerinae

#### Tribe Loricerini

##### Genus *Loricera*

#### *Loricera pilicornis* F. (Plate 35)

**Habitat:** In dense vegetation at margins of slow streams, ponds and bogs, best collected by treading. In early spring, it has been collected in a suburban garden.

**Flight dynamics:** Fully winged, in light trap records. **Biology:** A specialized feeder on Collembola (springtails). It traps them in a cage formed by heavy bristles around head and antennae; reported to make a faint buzzing sound when threatened, overwinters as adult, teneral adults may be found from June through July.

**General range:** A circumpolar species. Found in western Europe including the British Isles, south to northern Spain, southern Italy, northern former Yugoslavia, Iran, Siberia, east to Ussuri River and Kamchatka, in some areas reaches the Arctic Ocean. In North America northeast to Labrador and Newfoundland, in Québec north to Schefferville and Great Whale River, in Ontario north to Hudson Bay, in the Yukon north to Kluane River, in Alaska west to the lower Yukon Valley and Alaska Peninsula, west to British Columbia, Washington, and Oregon, but not west of the Cascade Range (where it is replaced by *Loricera decempunctata* Eschscholtz and *Loricera foveata* LeConte). In the Sierra Nevada of California, south in mountains to Utah, New Mexico, south to South Dakota, Minnesota, Indiana, Ohio, Pennsylvania, and New Jersey.

**Maine localities (23):** Alder Stream Township (CNC), Chain of Ponds Township (CNC), Corinna (RENC), Eustis (CNC), Fairfield (RENC), Gilead (RENC), Islesboro (PVT), Kibby Township (MFS), Kingfield (MFS), Lewiston (MFS), Milbridge (MFS), Mount Vernon (MFS), Nesourdnahunk Township (CNC), Saint Francis (CNC), Sidney (PVT), RENC), Southwest Harbor (PROC), Sweden (CNC), T3 R10 WELS (RENC), T3 R8

WELS (RENC), Waterville (RENC), Whiting (CNC), Wilton (CNC), Woodstock (MFS).

### Subfamily Elaphrinae

#### Tribe Elaphrini

##### Genus *Blethisa*

#### *Blethisa hudsonica* Casey (Plate 18)

**Habitat:** In seasonally flooded marshes and permanent marshes, among mosses, sedges, or other plants, in channels through the floodplain forest, and in the outer margins of open marshes, normally in floating mats of vegetation.

**Flight dynamics:** Fully winged, in light trap records. **Biology:** Hibernates as an adult. The adults stridulate. Gravid females appear in July.

**General range:** A boreal species from Yukon and Rocky Mountains east across Canada and the northern USA to Newfoundland and Maine, south to British Columbia, Montana, North Dakota, northern Illinois, Michigan, Pennsylvania, New York, and Massachusetts.

**Maine localities (6):** Bigelow Township (UVM), Blanchard Township (RENC), Eustis (CNC), Monmouth (MFS), Newport (RENC), Whiting (RPWC).

#### *Blethisa julii* LeConte (Plate 18)

**Habitat:** In cold pools among mosses and sedges.

**Flight dynamics:** Fully winged, no flight records.

**Biology:** According to Darlington, it is common and active from late June to late July on Mt. Washington (New Hampshire). He stated that it emerges from deep moss in the evening or early morning to feed on insects that have drowned. Larvae have been caught in mid-summer, and new adults emerge in late summer and probably overwinter in that stage.

**General range:** A northern transcontinental species. Northeast to Newfoundland, in Québec north to Lac St. Jean, Abitibi, north to Hudson Bay and Ft. Smith, Northwest Territory; west to Anchorage, Alaska, south to Alberta, northern Michigan, New York, Vermont, and New Hampshire.

**Maine localities (2):** Mount Katahdin Township (CNC), Winslow (PVT).

#### *Blethisa quadricollis* Haldeman (Plate 18)

**Habitat:** Floating mats of mosses, sphagnum, or grasses in acidic bogs or fens, more common in mixed sphagnum-graminoid substrates than in pure sphagnum.

**Flight dynamics:** Fully winged, flight observed.

**Biology:** Adults emerge in late summer and overwinter in this stage, gravid females were observed in early July; when handled, it may

stridulate and also emit a secretion with the odor of burnt chocolate. It is an amphibious species, very agile in sphagnum and sensitive to vibrations; it has been observed to dive to a depth of 7.5 cm and stay underwater for about three minutes.

**General range:** A northern transcontinental species. Northeast to Goose Bay, Labrador, limits not well known in northern Québec and Ontario, north at least to southern Northwest Territories and Yukon, in Alaska west to Anchorage region, in British Columbia southwest to Fraser Lake, south to near Calgary in southern Alberta, in Saskatchewan south to vicinity of Saskatoon, south to southern Manitoba, northern Illinois, Indiana, Ohio, Pennsylvania, and Massachusetts.

**Maine localities (10):** Appleton (RPWC), Belgrade (RENC), Brighton Plantation (RENC), Crystal (UVM), Monmouth (MFS), Phippsburg (RENC), Rumford (CNC), T1 R9 WELS (RENC), Troy (RENC), Vassalboro (PVT).

### Genus *Elaphrus*

#### *Elaphrus americanus americanus* Dejean (Plate 30)

**Habitat:** Level organic-rich mud or sand banks along slow meandering streams open to the sun but sheltered from winds, not to be found with *Elaphrus californicus* Mannerheim, which prefers more organic-free substrates. Can be found with *E. olivaceus* LeConte if the organic substrates are sufficiently coarse-grained.

**Flight dynamics:** Fully winged, frequent flier, makes diurnal flights in spring, in light trap records.

**Biology:** Teneral adults emerge in mid-July; like other *Elaphrus*, it stridulates; a diurnal running predator that finds prey by sight.

**General range:** A northern, nearly transcontinental subspecies. Northeast to Newfoundland, Labrador, in Québec north to Ungava Bay and Hudson Bay, in Ontario north to Hudson Bay, in Northwest Territories north to Great Slave Lake and the Mackenzie Delta, west to the eastern third of Yukon River valley in Alaska, southwest to Pacific coast of Alaska and Cook Inlet, south to central British Columbia and Alberta, southern prairie provinces, northern Minnesota, Wisconsin, and Michigan; in Ontario south to Lake Ontario, in northern New York, New Hampshire, and Maine. Another subspecies (*Elaphrus americanus sylvanus* Goulet) occupies southern British Columbia and adjacent Alberta, the coast ranges and the Cascades of Washington and Oregon and Rocky Mountains through Idaho to Colorado.

**Maine localities (8):** Columbia Falls (MFS), Eliot (RPWC), Fairfield (RENC), Lubec (MFS), Sidney (RENC), Skowhegan (RENC), Waterville (RENC), Winslow (PVT).

#### *Elaphrus californicus* Mannerheim (Plate 30)

**Habitat:** On mud and clay banks along slow streams; in early spring, can be found by vernal pools or in bare fields away from streams, as long as the substrates are wet and inorganic; will not be found with *E. americanus*, which prefers more organic substrates.

**Flight dynamics:** Fully winged, diurnal frequent flier, in light trap records.

**Biology:** Same as previous species.

**General range:** A transcontinental species. Northeast to Nova Scotia and New Brunswick, in Québec north to Lac St. Jean and Abitibi, in Ontario north to Thunder Bay and lake of the Woods, in Manitoba north to Lake Winnipegosis, in Northwest Territories north to Norman Wells, northwest to Ft. Yukon, Alaska, west to the Pacific in British Columbia, Washington, Oregon, and California, south and east to Nevada, Utah, New Mexico, Texas, Louisiana, and Florida.

**Maine localities (16):** Anson (RENC), Auburn (CNC), Bar Harbor (UVM), Cherryfield (RENC), Clinton (RENC), Cumberland (RENC), Fairfield (RENC), Lewiston (MFS), Mercer (RENC), Mount Vernon (RENC), Norridgewock (RENC), Sidney (PVT, RENC), Skowhegan (RENC), Cathance Township (RPWC), Unity (RENC), Washington (RENC).

#### *Elaphrus cicatricosus* LeConte (Plate 30)

**Habitat:** Wet mud in dense shade beneath alder thickets, and on shores of beaver ponds.

**Flight dynamics:** Fully winged, no light trap records.

**Biology:** Teneral adults emerge in August; overwinter as adults.

**General range:** A species limited to the northeastern USA. Northeast to western Maine, in Québec known only from Knowlton; also in central and western New York, southern Michigan, eastern Ohio, southwestern Pennsylvania, northern Virginia, and northeastern Tennessee (and an isolated record from Mississippi).

**Maine locality (1):** Fairfield (RENC).

#### *Elaphrus clairvillei* Kirby (Plate 30)

**Habitat:** Soft, wet organic mud in shaded places along rivers and lakes, often among dense sedges, cattails or alders.

**Flight dynamics:** Fully winged, flight records.

**Biology:** Gravid females found in June, teneral adults in July – August; both new and old adults overwinter in forest litter or beneath bark of fallen logs. Also stridulates.

**General range:** A transcontinental species. Northeast to Newfoundland and southern Labrador, in Québec north to the North Shore and James Bay, in Manitoba north to Hudson Bay, in Northwest Territories north to Great Bear Lake

and the Mackenzie Delta, in Alaska west to Circle and Anchorage, west to the Pacific in British Columbia, including the Queen Charlotte Islands, west to the Pacific coast in Washington and Oregon, south to southern Utah, eastern Arizona, northern New Mexico, absent from most of the Great Plains, but from Canada south to Minnesota, Wisconsin, northern Indiana, northwestern Pennsylvania, and the mountains of northern New Jersey.

**Maine localities (13):** Batchelders Grant Township (UVM), Belgrade (RENC), Cape Elizabeth (RENC), Eliot (RPWC), Harrington (UVM), Lily Bay Township (UVM), Lubec (RPWC), Mount Vernon (RENC), Newport (RENC), Rumford (CNC), T5 R18 WELS (RPWC), Trout Brook Township (RENC), Waterville (RENC).

***Elaphrus fuliginosus* Say (state record only from Bousquet and Larochelle (1993) and Bousquet (2010))**

**Habitat:** Wet margins of ponds and lakes on sandy soils with little vegetation cover.

**Flight dynamics:** Fully winged and capable of flight; occasionally attracted to artificial lights at night.

**Biology:** General adults appear in late July and August; overwinters as adults. Egg-laying probably in late June into July.

**General range:** In a band across the northeastern USA and southern tier of Canada, from Québec and Ontario west through Manitoba to Alberta, south to South Dakota, Nebraska, Iowa, Illinois, Indiana, east to Maryland and New Jersey, north to include Vermont, New Hampshire, and Maine.

**Maine localities:** No specific Maine localities known.

***Elaphrus olivaceus* LeConte (Plate 30)**

**Habitat:** On bare, open mud or sand bordering ponds or slow streams, sometimes in muddy spots in bogs, especially common near beaver ponds; more often by cleaner, colder waters than *E. clairvillei*.

**Flight dynamics:** Fully winged, no flight records.

**Biology:** General adults observed in late August; diurnal, active in bright sunlight as a visual hunter, has been taken in beaver lodges.

**General range:** A nearly transcontinental species, however, not reaching the Pacific Coast. Northeast to Newfoundland, in Québec north to Manicouagan and Abitibi, in Ontario north to the Albany River, in Alberta north to Lesser Slave Lake, west to the Fraser River, not in the mountains of the west coast but in the Rockies south to Colorado and Utah, in the Great Plains south to northern Nebraska, farther east, south to southern Minnesota, central Illinois, southern Michigan, and northern New Jersey.

**Maine localities (16):** Bar Harbor (UVM) Baring Plantation (CNC), Batchelders Grant Township (RENC), Brighton Plantation (RENC), Carrabassett Valley (PVT, RENC), Edmunds Township (CNC), Fairfield (RENC), Harrington (UVM), Lubec (RPWC), Mount Desert (UVM), Mount Katahdin Township (PVT, RENC), Mount Vernon (MFS), Rumford (CNC), Cathance Township (RPWC), T3 R10 WELS (RENC), T8 R5 WELS (CNC).

***Elaphrus ruscarius* Say (Plate 30)**

**Habitat:** On wet beaches bordering rivers, swamps, and ditches; on organic substrates near the northern limit of its range, can be found with *E. olivaceus*. Occasionally found on the banks of beaver ponds.

**Flight dynamics:** Fully winged, no flight records.

**Biology:** Diurnal, a fast-running visual predator.

**General range:** An eastern and central North American species. Northeast to coastal areas of eastern Maine, in New Hampshire north to the White Mountains, in Québec north to the Montreal area, in southern Ontario north to Ottawa and Lake Huron, in Michigan north to Saginaw Bay, in northern Wisconsin, northwest to Bemidji, Minnesota, west to southeastern South Dakota, to the 100<sup>th</sup> meridian in Kansas, in Texas west to the vicinity of Wichita Falls, Ft. Worth, and Houston, south to the Gulf of Mexico but not in the Florida Peninsula.

**Maine localities (9):** Bar Harbor (UVM), Columbia Falls (MFS), Coplin Plantation (RPWC), Eliot (RPWC), Harrington (UVM), Lewiston (MFS), Mount Vernon (MFS), Orono (MFS), Waterville (PVT).

**Subfamily Omphroninae**

**Tribe Omphronini**

**Genus *Omphron***

***Omphron americanum* Dejean (Plate 37)**

**Habitat:** Sandy to muddy banks along rivers and lakes, sometimes smaller ponds and streams.

**Flight dynamics:** Fully winged, light trap records.

**Biology:** General adults appear in September; the species tends to remain buried in sand by day, and may be collected by flooding banks. Active above ground during wet weather and at night. Sometimes found in sand traps of golf courses and running on the surface at night; makes a faint squeaking sound when handled.

**General range:** A nearly transcontinental species but absent from the West Coast. Northeast to Newfoundland, in Québec north to the Gaspé and Ft. Coulange, in Ontario north to Lakes Superior and Nipigon, in Manitoba north to Lake Winnipeg, in southern Alberta north

to Medicine Hat, west to Idaho, Utah and Arizona, south to Mexico and the Gulf Coast including Florida.

Maine localities (28): Anson (RENC), Bancroft (CNC), Belgrade (PVT), Berwick (CNC), Caratunk (RENC), Cornish (RPWC), Cutler (CNC), Embden (RPWC), Fairfield (RENC), Fryeburg (RPWC), Lewiston (MFS), Mercer (RENC), Moscow (RENC), Mount Katahdin Township (RENC), Mount Vernon (MFS), New Sharon (RENC), Newburgh (RPWC), Norridgewock (RENC), Orono (PVT), Readfield (MFS), Sidney (RENC), Skowhegan (RENC), Strong (RENC), Turner (RENC), Vassalboro (PVT), Waterboro (RENC), Waterford (RENC), Waterville (RENC).

### ***Omophron labiatum* Dejean**

Habitat: Open, sandy, and usually damp ground along the coastal zone, from sea beaches inland to altitudes up to about 275 m. May be found on saline beaches or on the bare shores of ponds, lakes and rivers.

Flight dynamics: Fully winged, sometimes attracted to lights.

Biology: Nocturnal, usually hiding in burrows by day, though occasionally diurnally active. Adults have been found in every month of the year elsewhere in its range. Adults appear to be gregarious and may be found in quantity when encountered.

General range: A species of the eastern North American coast, from Nova Scotia in the north to Florida in the south, west along the northern coast of the Gulf of Mexico to at least Texas.

Maine localities: No specific Maine localities known; the record in Majka *et al.* (2011) was in error.

### ***Omophron tessellatum* Say (Plate 37)**

Habitat: Clean sand banks along rivers, lakeshores, and sea beaches, more strictly confined to big rivers and lakes than *O. americanum*.

Flight dynamics: Fully winged, no flight records.

Biology: Teneral adults appear in early October; like *O. americanum*, makes squeaking sound when handled. Adults active at night.

General range: A northeastern and central species. Northeast to Nova Scotia and New Brunswick, in Québec north to Québec City, in Manitoba north to Lake Winnipeg, in Alberta north to Medicine Hat, west to Montana, Wyoming, Colorado, south to Arizona, New Mexico and Texas, in the east south to Kentucky and Virginia.

Maine localities (6): Anson (RENC), Lewiston (MFS), Mercer (RENC), New Sharon (RENC), Norridgewock (RENC), Strong (RENC).

## **Subfamily Scaritinae**

### **Tribe Clivinini**

#### **Genus *Clivina***

### ***Clivina americana* Dejean (Plate 25)**

Habitat: Shores of rivers and lakes, in marshes, on mud and moist sand banks where it burrows beneath stones or logs.

Flight dynamics: Wings fully developed, in light trap records.

Biology: Teneral adults appear in September and overwinter as adults; has been caught in a beaver lodge.

General range: An east-central species. Northeast to Nova Scotia and New Brunswick, in Québec in St. Lawrence Valley north to Berthaville, in Ontario north to Ottawa and Kincardine, Lake Huron, in Michigan, Wisconsin, west to Iowa, Kansas, Oklahoma, and Texas, south to Louisiana and Florida.

Maine localities (9): Abbot (RENC), China (RENC), Cornish (CNC), Monmouth (CNC), Mount Vernon (RENC), Newfield (RPWC), Readfield (CNC), Sidney (RENC), Smithfield (RENC).

### ***Clivina collaris* (Herbst) (Plate 26)**

Habitat: Eutrophic fens, river banks, salt marshes, also associated with debris from greenhouses.

Flight dynamics: Fully winged, flight records from Europe.

Biology: Breeds in spring and early summer.

General range: An adventive Old World species. Northern Europe to southern Sweden and the British Isles, southern limit uncertain, in Russia south to the Caucasus, central Asia, and western Siberia. Introduced before 1838 in Massachusetts but spread to widely isolated spots in Maine, Québec, Ontario, Ohio, Manitoba, British Columbia, and Washington.

Maine locality (1): Skowhegan (RENC).

### ***Clivina fossor* (L.) (Plate 26)**

Habitat: Disturbed habitats, gardens, fields, pastures, and riverbanks, occasionally along forest streams and in subalpine vegetation at 1,200 m.

Flight dynamics: Dimorphic, frequent light trap records.

Biology: An omnivorous burrower like other members of the genus. In Europe, a pest on strawberries; in Vermont, observed eating rotting kernels on a corn cob partially buried by spring floods. Gravid females appear in early July, teneral adults emerge both in the early spring and in the fall.

General range: An adventive Old World species. Natural range includes the entire temperate zone from the British Isles and Europe to Kamchatka on the Pacific coast of Asia. Adventive in eastern Canada before 1915, now distributed in two

widely disjunct areas. In the West, found from British Columbia south to Oregon and inland to Alberta and Idaho. In the East, northeast to Newfoundland, in Québec north to Saguenay and Abitibi, north to Ontario and Michigan, northwest to Wisconsin, west to Illinois, south to Indiana, Ohio, Pennsylvania, and Massachusetts. An isolated record also exists from Georgia.

Maine localities (39): Albany Township (CNC), Alfred (RPWC), Auburn (CNC), Belgrade (RENC), Biddeford (PVT), Corinna (RENC), Cutler (CNC), Fairfield (PVT, RENC), Gorham (PVT), Gray (PVT), Hartland (RENC), Jim Pond Township (RENC), Kibby Township (MFS), Lebanon (UNH), Lewiston (MFS), Lincoln Plantation (CNC), Mount Desert (UVM), Mount Katahdin Township (CNC), Mount Vernon (MFS), Newport (RENC), Norridgewock (RENC), Oakland (RENC), Presque Isle (MFS), Reed Plantation (CNC), Rome (RENC), Sabattus (RENC), Sebec (PVT), Sidney (RENC), Skowhegan (PVT, RENC), Smithfield (CNC), Cross Lake Township (MFS), T3 R8 WELS (RENC), T4 R10 WELS (CNC), T5 R18 WELS (RPWC), T9 R5 WELS (MFS), Turner (RENC), Washburn (RENC), Waterville (RENC), Wayne (CNC).

***Clivina impressifrons* LeConte (Plate 26)**

Habitat: Riverside mud banks and cultivated fields.

Flight dynamics: Fully winged, a frequent flier to light traps in Midwest, rare in New England where it seemingly invaded in the last 50 years.

Biology: Hibernates as adult; an omnivorous species. Under the name “slender seed corn ground beetle”, has been considered a minor agricultural pest because it eats into sprouting corn in unusually wet fields.

General range: An eastern and central North American species. Northeast to central Maine, in Québec only recorded from Montreal, in Ontario many localities around the Great Lakes, north to Wisconsin, Minnesota, west to South Dakota, Nebraska, Colorado, Utah, south to Texas and the Gulf Coast states, to Georgia but not Florida.

Maine localities (2): Belgrade (RENC), Newport (RENC).

***Clivina pallida* Kirby (Plate 26)**

Habitat: Unknown; specimens from Belgrade were collected from half-rotten waste sawdust at a sawmill.

Flight dynamics: Fully winged; multiple light trap records.

Biology: Unknown.

General range: A coastal plain species. Northeast to Maine, but not otherwise recorded from New

England; known from New York, New Jersey, Virginia, the Carolinas, Georgia, Florida, west through Mississippi and part of Tennessee, Louisiana, and Texas.

Maine localities (2): Belgrade (RENC), Berwick (MFS).

**Genus *Schizogenius***

***Schizogenius amphibius* Haldeman (Plate 42)**

Habitat: In clean sand along rivers and lakes.

Flight dynamics: Fully winged.

Biology: Unknown.

General range: A northeastern species. Northeast to Maine, in Québec north to Montreal and Brome, in New York north to shore of Lake Ontario, in Ohio north to shore of Lake Erie, north to Tippecanoe River in Indiana, west to Pike County, Illinois, south to Kentucky and central Tennessee, Black Mountains of North Carolina, and the Virginia Piedmont.

Maine localities (2): Buxton (PVT), state record only (PVT).

***Schizogenius ferrugineus* Putzeys (state record only from Bousquet and Larochelle (1993) and Bousquet (2010))**

Habitat: Moist, sandy, unvegetated substrates at margins of streams, ponds, or lakes, as well as ocean beaches, sometimes some distant from the water.

Flight dynamics: Fully winged, occasionally found in wind-drift material but commonly attracted to artificial lights at night.

Biology: General adults appear in late summer into the early fall, adults overwinter; egg-laying seasonality unknown but probably in the late spring or early summer. A specialized burrower in clean sand, often under driftwood.

General range: Generally restricted to the USA, not west of the Rockies except in the southernmost part of its range; from Florida in the Southeast, west to New Mexico and Arizona, north to Colorado, north to Saskatchewan and Manitoba, east to Ontario, Vermont, New Hampshire, and Québec.

Maine localities: No specific Maine localities known.

***Schizogenius lineolatus* Say (Plate 42)**

Habitat: Fine gravel along streams and around isolated, warmer, stagnant pools near larger rivers.

Flight dynamics: Fully winged, in light trap records.

Biology: Gravid females appear in early June.

General range: An eastern and central North American species. NE to New Brunswick, in Québec north to Québec City, in Ontario north to Ottawa, Collingwood and Bayfield, west across Michigan and Wisconsin to Montana

and Wyoming, south to Kansas, Texas, northern Mexico, isolated record from Tuscaloosa, Alabama, absent from Louisiana, Mississippi, Florida and Georgia, as well as the coastal plain areas of Carolinas and Virginia.

Maine locality (1): Cornish (CNC).

***Schizogenius sulcifrons* Putzeys (Plate 42)**

Habitat: In gravel along river banks, under wood.

Flight dynamics: Fully winged, in light trap records.

Biology: A specialized burrower; teneral adults appear in mid-September.

General range: An eastern and central North American species. Northeast to New Brunswick, in Québec north to Québec City, in Ontario north to Toronto and London, west to Wisconsin and Illinois, south to Tennessee, in mountains of northern Alabama, Georgia, North Carolina, and northern Virginia.

Maine localities (3): Buxton (PVT, RENC), Mexico (CNC), Strong (RENC).

**Genus *Dyschirius***

***Dyschirius affinis* Fall (Plate 28)**

Habitat: Sloping clay banks at edges of rivers.

Flight dynamics: Fully winged, in light trap records.

Biology: Teneral adults emerge in early September.

General range: An east-central species. Northeast to Maine, in Québec north to Joliette, in southern Ontario, north to North Dakota, northwest to Montana, west to Wyoming and Colorado, southwest to Arizona, south to Texas, Oklahoma, Tennessee, and Virginia.

Maine localities (2): Auburn (CNC), Strong (RENC).

***Dyschirius curvispinus* Putzeys (Plate 28)**

Habitat: The Waterville specimen was taken on damp earth beneath a board on the margin of a lawn; Whitehead (1972) recorded the species from a pond margin in dunes in Texas.

Flight dynamics: Fully winged, but not known whether it is capable of flight.

Biology: Farther south, overwinters as an adult and breeds in spring.

General range: A coastal plain species (but distribution poorly known). Northeast to Waterville, Maine; also recorded in Connecticut, Mississippi, Texas, and New Mexico.

Maine locality (1): Waterville (RENC).

***Dyschirius dejeanii* Putzeys (Plate 28)**

Habitat: Burrows in mud bordering rivers and ponds, including beaver ponds. In New England, it reaches 900 m elevation.

Flight dynamics: Fully winged, light trap records.

Biology: Teneral adults seen from late June to mid-August; overwinters as adult.

General range: A transcontinental species. Northeast to Newfoundland, in Québec north to the Gaspé, Saguenay and Abitibi, north to Churchill, Manitoba, in the Northwest Territories, north to Ft. Smith, in Yukon north to Kluane, northwest to Ft. Yukon in central Alaska, west to interior of British Columbia, southwest in mountains to California, south in the Rocky Mountains to Utah and New Mexico, south to Kansas, Iowa, Indiana, Ohio, Pennsylvania, and New Jersey.

Maine localities (19): Action (CNC), Allagash (UNH), Auburn (CNC), Baring Plantation (CNC), Caratunk (RENC), Chesuncook Township (UNH), Edmunds Township (CNC), Eustis (CNC), Lewiston (MFS), Millinocket (UNH), Milo (CNC), Mount Desert (UVM), Mount Vernon (MFS), Newport (RENC), Rome (RENC), Sidney (RENC), Cross Lake Township (UNH), Vassalboro (PVT), Waterville (RENC).

***Dyschirius erythrocerus* LeConte (Plate 28)**

Habitat: In fine sand and silt at pond and slow stream margins; on the seashore on wet, clayish, muddy soil, under plant debris.

Flight dynamics: Fully winged, in light trap records.

Biology: Unknown.

General range: An eastern and central North American species. Northeast to western Newfoundland, in Québec north to Granby and Montreal area, in Ontario north to St. Catherines, northwest to Michigan, west to South Dakota, Nebraska, Kansas, south to Arkansas, Kentucky, Ohio, Pennsylvania, and New York.

Maine localities (5): Belgrade (RENC), Berwick (CNC), Lebanon (UNH), South Berwick (CNC), Waterville (RENC).

***Dyschirius globulosus* (Say) (Plate 28)**

Habitat: On bare, usually dry soil in gardens, sand pits, dirt roads, croplands, and higher, drier parts of river banks.

Flight dynamics: Dimorphic, flight observed in captivity and found in drift along Great Lakes.

Biology: Teneral adults appear from May to July and in September; specimens have been found under roots of goldenrod (*Solidago* spp.; Asteraceae); in Vermont, found at all elevations, common in alpine tundra; has been taken at open rock ledges, often in clumps of moss.

General range: A nearly transcontinental species, excluding the Pacific Coast and the Southwest. Northeast to Newfoundland, in Québec north to the Gaspé, Saguenay and Abitibi, in Ontario north to Nipigon, in Alberta north to McMurray, north to southern Yukon, northwest to Fairbanks, Alaska, west to the interior of British Columbia, south to Idaho, Colorado,

Nebraska, Missouri, Kentucky, Alabama, Georgia, and Florida.

Maine localities (7): Canaan (RENC), Columbia Falls (RENC), Fairfield (RENC), Parsonsfield (CNC, RPWC), Reed Plantation (CNC), Waterville (RENC), York (PVT).

***Dyschirius pilosus* LeConte (Plate 28)**

Habitat: On bare mud or sand banks along rivers and brooks, sometimes away from water.

Flight dynamics: Fully winged, no flight records.

Biology: Unknown.

General range: An eastern and central North American species. Northeast to New Brunswick, in Québec north to the vicinity of Montreal, to southern Manitoba, west to Montana, Nebraska, Kansas, Oklahoma and Texas, south to Louisiana, Kentucky, West Virginia, and Virginia.

Maine localities (2): Sidney (PVT, RENC), Waterville (RENC).

***Dyschirius politus* (Dejean) (Plate 29)**

Habitat: Sand by rivers and lakes, also sand pits.

Flight dynamics: Fully winged, common at light traps.

Biology: Teneral adults appear in September. Often associated with burrowing staphylinids of the genus *Bledius* Samouelle (Staphylinidae).

General range: A circumpolar species. In the Old World, west to the British Isles and France, south to northern Italy and Romania, across Russia to the Pacific. In North America, northeast to Newfoundland, in Québec north to Kamarouaska and Lac St. Jean, in Ontario north to Ogoki on the Albany River, in Alberta north to McMurray, northwest to Fairbanks, Alaska, west to the interior of British Columbia, south to Idaho, Utah, Wyoming, South Dakota, Michigan, Ohio, New York, and Massachusetts.

Maine localities (4): Belgrade (RENC), Carrabassett Valley (UVM), Harrington (UVM), Sidney (RENC).

***Dyschirius setosus* LeConte (Plate 29)**

Habitat: Sandy river beaches and also taken at border of a salt marsh; sometimes not by a body of water, for example in a moist roadside ditch.

Flight dynamics: Fully winged, no flight records.

Biology: Teneral adults known from late August.

Commonly associated with *D. pilosus*, gregarious.

General range: A transcontinental species. Northeast to Nova Scotia and New Brunswick, in Québec north along the St. Lawrence River to Riviere-du-Loup, in Alberta north to McMurray, northwest to Fairbanks, Alaska, west to Okanogan Valley of eastern Washington, south to Utah, Colorado, Nebraska, Iowa, Illinois, Michigan, New York, and Massachusetts.

Maine localities (4): Berwick (CNC), Harrington (UVM), Ogunquit (CNC), Phippsburg (RENC).

***Dyschirius sphaericollis* (Say) (Plate 29)**

Habitat: Sand bars, often muddy ones along rivers.

Flight dynamics: Fully winged, in light trap records.

Biology: Gravid females appear in June, teneral adults emerge from mid-June to late September. Associated with gregarious riverside beetles, *Bledius* and *Heterocerus* F. (Heteroceridae).

General range: An eastern central species. Northeast to Newfoundland, in Québec north to Saguenay and Hull, in Ontario north to Collingwood, in Manitoba north to Lake Manitoba, in Alberta north to Stettler (52° N), south to eastern Oregon, Utah, New Mexico, Texas, Missouri, Kentucky, and Virginia.

Maine localities (5): Belgrade (RENC), Bethel (CNC), Mercer (RENC), Norridgewock (RENC), Turner (RENC).

***Dyschirius sublaevis* Putzeys (Plate 29)**

Habitat: Seashores, on sandy soil under the roots of weeds, or on sandy flats.

Flight dynamics: According to Bousquet (2010), fully winged and capable of flight.

Biology: A spring breeder, overwintering as an adult.

General range: A coastal plain species. Atlantic coastal plain from Maine to Florida.

Maine localities (2): Kennebunkport (CNC), Ogunquit (UVM).

**Subfamily Broscinae**

**Tribe Broscini**

**Genus *Miscodera***

***Miscodera arctica* (Paykull) (state record only from Lindroth (1961), Bousquet and Larochelle (1993), and Bousquet (2010))**

Habitat: Dry areas with gravel and sand, usually beneath large, deeply buried stones; in Europe, adults feed on larvae of Byrrhidae (*Byrrhus* L., *Cytilus* Erichson), which are moss-feeders. Lindroth (1961) described the habitat as "sandy till with no or sparse coniferous trees and with low, thin ground vegetation, mostly tiny mosses or lichens." Niemelä *et al.* (1993) found it common in regenerating clear-cut forests. Spence *et al.* (1996) also found it in older mixed, largely poplar forests in Alberta, and Beaudry *et al.* (1997) found it in burned plots in clear-cuts of jack pine.

Flight dynamics: Fully winged, flight records for Europe.

Biology: In Europe, it has been found in sea drift, and numerous specimens were found on a

glacier at an altitude of 1,700 m (Lindroth 1945). In Québec, adults were collected from 14 June to 5 November (Laroche 1975). According to Lindroth (1961), it overwinters as an adult. It has been found in association with the byrrhid species *Byrrhus fasciatus* Forster and *Cytilus sericeus* Forster, and it is thought that these species are a major part of its prey (Lindroth 1945).

**General range:** A circumpolar species. Across northern Europe, Scandinavia, and Russia, some relict populations in Germany in remnants of heath, hills, and mountains of British Isles, isolated in Switzerland and Tyrol, across Siberia to Pacific. In North America, northeast to Labrador, in Québec north to Ungava Bay, in the Northwest Territories, north to Norman Wells and Ft. Resolution, west in Alaska to Fairbanks and Denali National Park, south to Washington, Montana and Colorado in the mountains, south to Cypress Hills in Saskatchewan, to northern Minnesota, Wisconsin, and Michigan, in Ontario south to Simcoe Co., widespread in Québec south to 47<sup>th</sup> parallel, farther south restricted to higher elevations, most southern record is at Val Racine near Lac Mégantic; in northern New England, only in the White Mountains and the high plateau north of them, including northeast Vermont.

**Maine locality (1):** state record only (PVT), probably Mt. Katahdin (Katahdin Township).

### Subfamily Trechinae

#### Tribe Trechini

#### Genus *Trechus*

#### *Trechus apicalis* Motschulsky (Plate 45)

**Habitat:** In forests under fallen logs and stones that are partly buried; also in crumbling wood of old rotten logs and in leaf litter.

**Flight dynamics:** Wings dimorphic, fully winged form very rare (0.2% of population), flight observations at dusk.

**Biology:** Teneral adults emerge from June to early August, and gravid females appear from July to early August.

**General range:** A transcontinental species, extending also to eastern Siberia (west to the Verkhoyansk Range and Stanovoy Mountains). Northeast to Newfoundland and Labrador, in Québec north to Schefferville and Ft. George, in Ontario and Manitoba north to Hudson Bay, in the Northwest Territories north to Aklavik, in Alaska south of treeline but not in tundra, in British Columbia south to Canal Flats but not south of US border in the west, in Alberta south to Banff, south to northern Minnesota, Wisconsin, northern Indiana, northern Ohio, New York, New Jersey,

Massachusetts, Connecticut, Vermont, New Hampshire, and Maine.

**Maine localities (22):** Cape Elizabeth (PVT), Carrabassett Valley (PVT), Chain of Ponds Township (CNC), Deer Isle (RENC), Georgetown (PVT), Grafton Township (CNC), Grand Isle (CNC), Jackman (CNC), Kibby Township (MFS), Lewiston (MFS), Lubec (PVT), Mount Desert (PROC, UVM), Mount Katahdin Township (RENC), Nesourdahunk Township (CNC), Orono (UNH), Riley Township (UVM), Sidney (RENC), T11 R10 WELS (MFS), T14 R15 WELS (CNC), T16 R13 WELS (CNC), T4 R10 WELS (CNC), Waterville (RENC).

#### *Trechus crassiscapus* Lindroth (Plate 46)

**Habitat:** More hygrophilous than preceding species, in mountain forests of New England from 770–1,200 m elevation, usually in moss mat, often in small patches of sphagnum at boggy spots in balsam fir forest or among alders in larger wet areas. Farther north at borders of ponds, swamps and wooded lake margins.

**Flight dynamics:** Brachypterous, or possibly dimorphic (only a small sample studied).

**Biology:** Gravid females appear in early July, teneral adults emerge in mid-August.

**General range:** A northeastern species. Northeast to Newfoundland and Labrador, in Québec north to Schefferville and Ft. George, west to Ontario; in Québec south to the St. Lawrence River, south of there confined to the Adirondacks of New York, the Green Mountains of Vermont and Massachusetts, and the White Mountains of New Hampshire and westernmost Maine.

**Maine localities (2):** Kibby Township (MFS), Lubec (PVT).

#### *Trechus rubens* (F.) (Plate 46)

**Habitat:** Open, weedy ground among the roots of tall plants, also in wooded areas among fallen leaves; also at borders of marshes, swamps and ponds in sphagnum and sedges (*Carex* spp.; Cyperaceae).

**Flight dynamics:** Fully winged, nocturnal; multiple light trap records.

**Biology:** Teneral adults appear from July into August, gravid females have been documented from late July into early August.

**General range:** An Old World species, adventive in North America. In the Old World, Scandinavia and northern Russia, in northern Siberia east to the Lena River and isolated in the mountains of France, Italy, Bosnia, Transylvania and in the Caucasus. In the New World, it is a northeastern species, introduced into Nova Scotia by 1875 and reaching Québec by 1926. Northeast to Newfoundland, in Québec north

to Mingan and Saguenay, west to Montreal and Abitibi, and only in extreme northern New England.

Maine localities (5): Carrabassett Valley (PVT), Codyville Plantation (RPWC), Madrid Township (CNC), T4 R10 WELS (CNC), T5 R18 WELS (RPWC).

### Genus *Blemus*

#### *Blemus discus* (F.) (Plate 18)

Habitat: In soil, often in rodent burrows, especially where the burrows go under boards or partially buried stones, sometimes under driftwood along rivers, has been taken in beaver lodges, seems to favor areas with long grass in old fields.

Flight dynamics: Fully winged, in light trap records particularly in August.

Biology: General adults appear from late June to early July with a second period of emergence in late August into September; hibernates at least in part as adults.

General range: An Old World species, adventive before 1933. Found throughout most of Europe, north to southern Scandinavia, in Russia north to St. Petersburg, west to Great Britain and Ireland, south to southern France, central Italy and Transylvania, southern Siberia, Manchuria, China, and Japan. In the New World, east to Nova Scotia and New Brunswick, in Québec north to Gaspé, Saguenay and Abitibi, west to Michigan, south to Ohio, New York, and Massachusetts.

Maine localities (16): Allagash (UNH), Ashland (UNH), Belgrade (RENC), Dennistown Plantation (UNH), Eustis (MFS), Fairfield (PVT), Lebanon (UNH), Lewiston (MFS), Mount Vernon (MFS), Oxbow Plantation ((MFS), Rangeley (UNH), T17 R4 WELS (UNH), Cross Lake Township (MFS), T8 R19 WELS (MFS), T9 R5 WELS (MFS), Wayne (CNC).

### Tribe *Bembidiini*

#### Subtribe *Bembidiina*

### Genus *Asaphidion*

#### *Asaphidion curtum* (Heyden) (Plate 10)

Habitat: Lives on moist clay or clay/sand, mixed with sparse vegetation, on river banks, ocean shores, clay pits or cultivated soil.

Flight dynamics: Fully winged, no flight records.

Biology: Unknown.

General range: An Old World species, native to Ireland, Denmark, Germany, Spain, Italy, and Algeria and Tunisia in North Africa. In North America, adventive along the northeastern coast of the USA, from Maine to New York.

Maine localities (1): Camden (CNC).

### Genus *Bembidion*

#### *Bembidion americanum* Dejean (Plate 11)

Habitat: Bare mud banks and flats on shores of rivers and lakes.

Flight dynamics: Fully winged, a frequent flier, often taking flight when disturbed, recorded from light traps.

Biology: A large-eyed, partly diurnal species, but in the spring flies by night. A wary, alert species.

General range: An eastern species. Northeast to New Brunswick, in Québec north to Québec City and Montreal, southern Ontario, Michigan, Minnesota, west to Kansas, southwest to Texas, south to Louisiana and Florida.

Maine localities (8): Bigelow Township (UVM), Buxton (RENC), Fryeburg (RPWC), Lewiston (MFS), Norridgewock (RENC), Readfield (CNC), Sidney (RENC), Cathance Township (RPWC).

#### *Bembidion antiquum* Dejean (Plate 11)

Habitat: Cobble and gravel shores of running waters, from small creeks to large rivers; most common on upstream or downstream ends of small, relatively flat islands bordered by riffles.

Flight dynamics: Fully winged; will take flight if approached on a sunny day.

Biology: Unknown

General range: Generally in Southeastern Canada and the eastern USA, from Nova Scotia across New Brunswick and Québec to the north shore of Lake Superior, south to northern Arkansas and in the Appalachians in northern Alabama; one (possibly mislabeled) outlier known from Alberta.

Maine localities (3): Allagash (Maddison), Cornish (Maddison), Howland (Maddison).

#### *Bembidion basicorne* Notman (Plate 11)

Habitat: Bare gravel bars in cold, clear mountain brooks, usually in deep shade.

Flight dynamics: Fully winged, no flight records.

Biology: Unknown.

General range: An Appalachian species. Northeast to Nova Scotia, southern Québec, Vermont, New Hampshire, Massachusetts, New York, Pennsylvania, Ohio, Virginia, West Virginia, and North Carolina.

Maine localities (2): Allagash (CNC), Newry (UVM).

#### *Bembidion bellorum* Maddison (Plate 12)

Habitat: Cobble and gravel shores of running waters, generally on larger streams and rivers; most common on upstream or downstream ends of small, relatively flat islands bordered by riffles.

Flight dynamics: Fully winged, no flight records.

Biology: Unknown.

General range: An Appalachian species, ranging from Maine in the Northeast southwestwards across New Hampshire and Vermont, New York, Pennsylvania, West Virginia, Kentucky, with one locality southeast of Columbus in central Ohio.

Maine localities (1): Greenwood (Maddison).

***Bembidion bruxellense* Wesmael (Plate 12)**

Habitat: Moist, firm soil with sparse vegetation, especially at the borders of temporary pools.

Flight dynamics: Fully winged, frequent flier, recorded from light traps.

Biology: Hibernates as adult, spring breeder.

General range: An Old World species adventive in North America. In Europe from the Arctic Ocean south to the Alps, across Siberia to east Lake Baikal. Adventive in Newfoundland before 1907. In Québec from the north shore of the St. Lawrence west to Abitibi, otherwise limited to New Hampshire and Maine, and the Maritime Provinces of Canada.

Maine localities (2): Allagash (CNC), Mt. Katahdin Township (CNC).

***Bembidion carinula* Chaudoir (Plate 12)**

Habitat: Barren sand banks and bars of rivers and lakes.

Flight dynamics: Fully winged, a day flier.

Biology: Diurnal, keeps close to water's edge. Hibernation as adult.

General range: Nearly transcontinental in the North. Northeast to Newfoundland and Labrador, in Québec north to Ft. Chimo on Ungava, in Ontario and Manitoba north to Hudson Bay, in the Northwest Territories north to Great Slave Lake and Norman, west to the Rocky Mountains and British Columbia, not reaching the US border in the Great Plains, south to Iowa, Kentucky, in the east south only to New Jersey and Connecticut.

Maine localities (14): Anson (PVT, RENC), Berwick (CNC), Bigelow Township (UVM), Chain of Ponds Township (CNC), Fryeburg (CNC, RPWC), Mexico (CNC), Mount Katahdin Township (RENC), New Sharon (RENC), Norridgewock (RENC), Readfield (CNC), Strong (RENC), T18 ED BPP (RPWC), T3 R8 WELS (RENC), T8 R14 WELS (PVT).

***Bembidion carolinense* Casey (Plate 12)**

Habitat: Bare gravel banks along cold mountain streams.

Flight dynamics: Fully winged, in light trap records.

Biology: Teneral adults known appearing from July to mid-September.

General range: An Appalachian and eastern species, Northeast to Newfoundland, in Québec north to the North Shore and Abitibi, range interrupted by the flat region of the St. Lawrence;

present, however, in southern Québec, westernmost record in Québec in Vaudreuil Co., south to Kentucky, Tennessee, and North Carolina.

Maine localities (23): Adamstown Township (CNC), Appleton (CNC), Batchelders Grant Township (RENC), Benton (PVT), Byron (CNC), Cornish (RPWC), Embden (RPWC), Eustis (CNC), Grand Isle (CNC), Madrid Township (CNC), Mount Katahdin Township (RENC), Nesourdnahunk Township (CNC), Newry (CNC, UVM), Old Town (PVT), Parlin Pond Township (CNC), Pittston Academy Grant (RPWC), T10 R7 WELS (MFS), T14 R15 WELS (CNC), T3 R10 WELS (UVM), T3 R8 WELS (RENC), T5 R9 WELS (CNC), Waterville (RENC), Weld (CNC).

***Bembidion castor* Lindroth (Plate 12)**

Habitat: Borders of rivers, lakes and large brooks, usually on sand near water. Despite the species name, it is not found by beaver ponds in Vermont. It does not ascend into the mountains.

Flight dynamics: Fully winged, light trap records.

Biology: Teneral adults appear in July.

General range: Widespread east of the Rocky Mountains. Northeast to Newfoundland, in Québec north to the North Shore and Abitibi, in Ontario, north to Terrace Bay on the north side to Lake Superior, north to southern Manitoba, northwest to Edmonton, Alberta, west to Montana, south to South Dakota, Iowa, Michigan, Ohio, West Virginia, and Virginia.

Maine localities (30): Andover (CNC), Anson (RENC), Auburn (CNC), Bancroft (CNC), Brownville (CNC), Cornish (CNC), Edmunds Township (CNC), Embden (RPWC), Fairfield (RENC), Fort Kent (CNC), Fryeburg (CNC, RPWC), Grand Isle (CNC), Harrington (UVM), Lewiston (MFS), Mercer (RENC), Mexico (CNC), Mount Vernon (MFS), New Sharon (RENC), Newry (CNC), Norridgewock (RENC), Old Town (PVT), Sidney (RENC), Squapan Township (CNC), Strong (RENC), Turner (RENC), Unity (RENC), Waterville (RENC), Whiting (RPWC), Winslow (RENC).

***Bembidion chalconeum* Dejean (Plate 12)**

Habitat: On cobble and gravel bars of rivers, particularly on islands; can also be found on gravel pond and lake shores, including ponds in gravel pits, and occasionally on sandy substrates.

Flight dynamics: Fully winged, takes flight easily.

Biology: Unknown.

General range: Newfoundland and northern Québec west to the Northwest Territories and the Cascade Range in British Columbia and Washington, south in the Rockies to

Colorado and western Nebraska, in the East south to South Carolina and northern Arkansas.

**Maine localities (13):** Allagash (Maddison), Bethel (Maddison), Chain of Ponds Township (Maddison), Cornish (Maddison), Gilead (Maddison), Mexico (Maddison), Newry (Maddison), Anson (Maddison), Saco (Maddison), T17 R4 WELS (Maddison), Andover (Maddison), T4 R10 WELS (Maddison), T5 R9 WELS (Maddison).

***Bembidion cheyennense* Casey (Plate 12)**

**Habitat:** Bare mud banks on shores of rivers and lakes (same as for *B. americanum*).

**Flight dynamics:** Fully winged, no flight records.

**Biology:** Diurnal, sight predator with large eyes.

**General range:** Formerly a western species, recently invading the northeastern USA after 1960. Northeastern most record: Mt. Vernon, Maine; north in Québec to Lac St. Jean, north to Saskatoon, Saskatchewan, and Edmonton, Alberta, west in British Columbia to Vancouver Island; in the USA, west to Washington, Oregon, and California, south to southern California and Texas, southeast to Kansas, Missouri, Wisconsin, Michigan, Ohio, Pennsylvania, southern Vermont, and New Hampshire.

**Maine localities (1):** Mt. Vernon (MFS).

***Bembidion concolor* Kirby**

It is doubtful that this old record (PVT) is valid for Maine, although the species likely is to be found in the state, particularly along cool, rocky streams in the northern portion. Before the work of Lindroth, however, the name “*concolor*” was commonly applied to what is now recognized as *Bembidion salebratum* LeConte.

***Bembidion concretum* Casey (Plate 12)**

**Habitat:** Richly organic marshes with sedges and cattails, often at the edges of beaver ponds. In New England, at all elevations up to the treeline, sometimes in beaver lodges.

**Flight dynamics:** Fully winged, no light trap records.

**Biology:** Teneral adults appear from mid-July to August.

**General range:** Widespread across North America but not reaching the Pacific Coast. Northeast to Newfoundland, in Québec to the North Shore and James Bay, in Ontario north to Lake Nipigon, in the Northwest Territories north to Yellowknife and Aklavik; in the interior of Alaska west to Fairbanks and Ft. Yukon, widespread in British Columbia but not reaching the Pacific, south to Oregon, Montana, Nebraska, Illinois, Ohio, West Virginia, and Virginia.

**Maine localities (35):** Acton (CNC), Albany Township (CNC), Alfred (RENC, RPWC), Ashland (UNH), Auburn (RPWC), Baileyville (UNH),

Bangor (CNC), Belgrade (RENC), Bethel (CNC), Blanchard Township (RENC), Durham (RPWC), Eustis (CNC), Fairfield (RENC), Guilford (RENC), Holeb Township (UNH), Kibby Township (MFS), Lebanon (UNH), Lewiston (MFS), Lily Bay Township (UVM), Long Pond Township (CNC), Lubec (RPWC), Millinocket (UNH), Milo (CNC), Mount Desert (UVM), Mt. Katahdin Township (CNC), Nashville Plantation (MFS), Paris (MFS), Rangeley (UNH), T1 R13 WELS (UNH), T12 R8 WELS (MFS), T17 R4 WELS (CNC), T2 R9 WELS (RENC), T3 R11 WELS (MFS), Wales (CNC), Waterboro (RENC).

***Bembidion confusum* Hayward (Plate 12)**

**Habitat:** On barren sand banks along medium to large rivers.

**Flight dynamics:** Fully winged, a day flier.

**Biology:** An alert, wary species; a sight predator, flies to escape, also a fast runner; teneral adults appear in August.

**General range:** An eastern and central species. NE to New Brunswick, in Québec near Québec City and to Hull on the Ottawa River, north to Collingwood on Georgian Bay, in Manitoba north to Lake Winnipeg, NW to Alberta; in the U.S., west to Montana and Colorado, south to Texas, Louisiana and Florida.

**Maine localities (3):** Anson (PVT), New Sharon (RENC), Norridgewock (RENC).

***Bembidion constrictum* LeConte (Plate 13)**

**Habitat:** In salt marshes bordering tidal bays and under algal crusts and seaweed, most common along tidal pool margins in salt marshes

**Flight dynamics:** Fully winged, no flight observations.

**Biology:** Partly diurnal.

**General range:** Coastal species from Labrador to Texas. (There are no records from the Gulf of St. Lawrence.)

**Maine localities (4):** Addison (RPWC), Berwick (CNC), Harrington (RPWC), Steuben (UVM).

***Bembidion contractum* Say (Plate 13)**

**Habitat:** Salt marshes bordering tidal bays, under algal crust. This species is most frequent among salt grasses on the margin of tidal streams., also occurs under drift material along sea beaches near salt marshes.

**Flight dynamics:** Wings reduced, flightless.

**Biology:** One record of a teneral specimen taken in late July.

**General range:** A coastal species, from southwestern Newfoundland south to Alabama (including the Gulf of St. Lawrence).

**Maine localities (7):** Addison (RPWC), Cutler (CNC), Georgetown (MFS, UVM), Hancock

(CNC), Harrington (UVM), Portland (PVT), Steuben (UVM).

***Bembidion fortetrium* (Motschulsky) (Plate 13)**

Habitat: In fens, marshes and sphagnum mats.

Flight dynamics: Fully winged, light records.

Biology: Hibernates as an adult.

General range: A transcontinental species. Northeast to Newfoundland, in Québec north to Lac St. Jean and Abitibi, in Ontario north to Sudbury and Long Lac, north to the Northwest Territories and Yukon Territory, northwest in Alaska to Anchorage and Fairbanks, in British Columbia west to the coast and Queen Charlotte Islands, south to Oregon and Wyoming, in the Great Plains not south of Canada, but farther east south to Michigan, northern Illinois, New York, and Connecticut.

Maine localities (9): Auburn (RPWC), Augusta (MFS), Bethel (CNC), Isle au Haut (CNC), Mount Desert (UVM), Sanford (CNC), T17 R4 WELS (CNC), Wales (CNC), Waterford (RPWC).

***Bembidion frontale* (LeConte) (Plate 13)**

Habitat: Mud along stream in shaded areas.

In Vermont, up to 1,200 m elevation; most common among sedges in swampy areas along river margins.

Flight dynamics: Fully winged, flight observations, in light trap records.

Biology: Diapauses as adult in dead leaves.

General range: Nearly transcontinental, not reaching Pacific Coast. Northeast to Nova Scotia and New Brunswick, in Québec north to the Gaspé and Abitibi, in Ontario north to Ottawa and Southampton, in the prairies north to Winnipeg and Saskatoon, west in British Columbia to the Okanagan Valley, south to Idaho, Kansas, Missouri, Illinois, Ohio, and Virginia.

Maine localities (33): Abbot (RENC), Andover (CNC), Appleton (CNC), Auburn (CNC, RPWC), Bancroft (CNC), Baring Plantation (CNC), Benton (RENC), Blanchard Township (RENC), Brighton Plantation (RENC), Burnham (RENC), Camden (CNC), Canaan (RENC), Connor Township (CNC), Corinna (RENC), Dixfield (RENC), Embden (RPWC), Fairfield (PVT, RENC), Fryeburg (RPWC, CNC), Gilead (RENC), Grand Isle (CNC), Hancock (CNC), Lebanon (CNC), Lewiston (MFS), Mount Desert (UVM), New Sharon (RENC), Oakfield (RPWC), Sidney (RENC), Skowhegan (RENC), Turner (RENC), Vassalboro (PVT), Waterford (RPWC), Waterville (RENC), Whiting (CNC).

***Bembidion graciliforme* Hayward (Plate 13)**

Habitat: In dense vegetation on the margins of standing waters, on mud. Especially common

near beaver ponds, also commonly found under leaves on vernal pool margins in floodplain forests.

Flight dynamics: Fully winged, light records.

Biology: Teneral adults appear in September, overwinter as adults.

General range: An eastern species. Northeast to Nova Scotia and New Brunswick, in Québec north to Montreal and Québec City, in Ontario north to Ottawa and Lake Huron, west to South Dakota and Iowa, south to Illinois, Ohio, Maryland, and Virginia.

Maine localities (26): Adamstown Township (CNC), Anson (PVT), Bar Harbor (UVM, PROC), Baring Plantation (CNC), Belgrade (RENC), Benton (RENC), Cape Elizabeth (RENC), Clinton (RENC), Corinna (RENC), Durham (RPWC), Fairfield (RENC), Fryeburg (RPWC), Hiram (CNC), Lewiston (MFS), Mount Desert (UVM), Oakfield (RPWC), Oakland (RENC), Orono (MFS), Readfield (CNC), Ripley (RENC), Sidney (RENC), T5 R18 WELS (RPWC), Waterford (RPWC), Waterville (RENC), Wayne (CNC), York (RPWC).

***Bembidion grapii* Gyllenhal (Plate 13)**

Habitat: On dry gravel or sand or on high exposed rock ledges, also under rocks on peaty soil above treeline. In New England, restricted to high mountain summits which are bare or with stunted trees, with most records above 1,200 m elevation, but down to 900 m on nearly completely barren ridges. In New Brunswick, found along moose trails in northern conifer forests on bare compact soil patches with high peat content, adults usually under scattered leaves in these bare patches.

Flight dynamics: Polymorphic, full wings rare, no flight records.

Biology: Teneral adults in July-August.

General range: Circumpolar. In Greenland, Iceland, northern Scandinavia, northern Russia, and Siberia, east to the Sea Okhotsk, isolated in the mountains of the Russian-Chinese border (Tian Shan). In North America, east to Newfoundland, in Québec north to Ungava Bay, in the Northwest Territories north to Reindeer Depot, in Alaska south to Seward, west to the Alaska Peninsula and the inner Aleutian Islands, south in the mountains to British Columbia, Montana, and New Mexico, south to the Black Hills of South Dakota, northern Minnesota and Michigan, northern Ontario, in Québec north of the St. Lawrence River and in the Gaspé. Relict populations south of the main range are found in the mountains of northern New England; the most southern record is from Massachusetts.

Maine localities (1): Wyman Township (UNH).

***Bembidion honestum* Say (Plate 13)**

Habitat: Generally on cobble and gravel bars of larger, more slowly moving rivers, cobbles usually partially coated with algae and other debris.

Flight dynamics: Fully winged, takes flight readily when disturbed.

Biology: Neotype was teneral, taken in late July.

General range: Newfoundland and northern Québec west to the Northwest Territories and the Cascade Range in British Columbia and Washington, south in the Rockies to Colorado and western Nebraska, in the East south to South Carolina and northern Arkansas.

Maine localities (6): Allagash (Maddison), Cornish (Maddison, RPWC), Gilead (Maddison), Howland (Maddison), Mexico (Maddison), Saco (Maddison).

***Bembidion immaturum* Lindroth (Plate 13)**

Habitat: Open muddy shores of rivers and lakes, usually under leaves and other debris.

Flight dynamics: Fully winged, in light trap records.

Biology: Teneral adults appear in mid-May.

General range: A northeastern species. Northeast to Newfoundland, in Québec north to Sept-Îles and to James Bay, recorded from Ontario, isolated record from Iowa, otherwise known from New York, Vermont, New Hampshire, Maine, and New Brunswick.

Maine localities (6): Bancroft (CNC), Eustis (CNC), Fort Kent (CNC), Greenville (MFS), Sidney (RENC), Unity (RENC).

***Bembidion impotens* Casey (record from Majka et al., 2011) (Plate 13)**

Habitat: On open to scantily vegetated fine sand to clay substrates, by still or slowly flowing waters.

Flight dynamics: Fully winged; occasionally found in wind-drift material but commonly attracted to artificial lights at night.

Biology: Teneral adults appear in mid- to late summer; overwinters as adults. Egg-laying seasonality apparently unknown.

General range: Generally across only southernmost Canada but including most of the continental USA, from New Brunswick west to southern British Columbia, south to California, Arizona, Texas, Louisiana, and Florida.

Maine localities (1): Clinton (PVT).

***Bembidion inaequale* Say (Plate 14)**

Habitat: On bare sand and clay near margins of lakes, rivers, small brooks or anywhere sand and clay is moist, also in sparse vegetation on sand, not necessarily in the vicinity of surface waters. Can be common away from water on bare soil gardens if the soil is moist.

Flight dynamics: Fully winged, a day flier.

Biology: Diurnal, runs and flies in bright sunshine. Teneral adults appear in late July.

General range: A transcontinental species. Northeast to Nova Scotia and New Brunswick, in Québec north to Lac St. Jean and Abitibi, across Ontario to southern Manitoba, Saskatchewan, Alberta and British Columbia, northwards into Alaska, farther south in the west to Washington and California, south to Nevada, Colorado, Kansas, Missouri, Mississippi, and Georgia.

Maine localities (26): Abbot (RENC), Anson (RENC), Auburn (CNC), Augusta (UNH), Bancroft (CNC), Batchelders Grant Township (RENC), Clinton (RENC), Comstock Township (RPWC), East Millinocket (CNC), Embden (PVT), Fairfield (PVT, RENC), Garfield Plantation (MFS), Grand Isle (CNC), Lewiston (MFS), Mercer (RENC), New Sharon (RENC), Newry (RENC), Norridgewock (RENC), Oakfield (RPWC), Sidney (PVT, RENC), Skowhegan (RENC), Smithfield (UNH), Squapan Township (CNC), Strong (RENC), Unity (RENC), Waterville (RENC).

***Bembidion incrematum* LeConte (Plate 14)**

Habitat: On bare mud on rivers and lakeshores, usually in deep shade. Darlington reported it also in the White Mountains. In wet grassy places, especially abundant in river deltas.

Flight dynamics: Fully winged, no flight records.

Biology: Teneral adults late July-August, probable adult hibernation.

General range: A transcontinental northern species. Northeast to Cape Breton Island, Nova Scotia and New Brunswick and southern Labrador, in Québec north to James Bay, in northern Ontario north to Moose Factory on Hudson Bay, in the Northwest Territories to Aklavik at the mouth of the Mackenzie River; in Alaska, west to Circle, south to the Kenai Peninsula and Sitka, throughout British Columbia, south in the mountains to California, south to Utah, Colorado, North Dakota, Michigan, southern Ontario, Pennsylvania, West Virginia, New York, and Massachusetts.

Maine localities (10): Adamstown Township (CNC), Baring Plantation (CNC), Carrabassett Valley (PVT), Edmunds Township (CNC), Grand Isle (CNC), Hiram (CNC), Lincoln (CNC), T8 R5 WELS (CNC), Wayne (CNC), Whiting (CNC).

***Bembidion intermedium* (Kirby) (Plate 14)**

Habitat: Mud or muddy sand on riverbanks.

Flight dynamics: Fully winged, in light trap records.

Biology: Hibernates as adult.

General range: Widespread species, but fails to reach either coast. East to south-central Maine (perhaps isolated there), next eastern records in

western Vermont, north to southwestern corner of Québec (Montreal region), in Ontario north to Lake Nipigon, northwest to Edmonton, Alberta, west to southeastern British Columbia, south to Wyoming, Nebraska, Minnesota, Michigan, Ohio and Delaware, not known from southern New England.

Maine localities (1): Fairfield (PVT).

***Bembidion lacunarium* (Zimmerman) (Plate 14)**

Habitat: Widespread along small forest streams and on damp sand along intermittent streams; in deep, shaded ravines under hemlocks; ascends mountains to the treeline.

Flight dynamics: Dimorphic; fully winged form rare, probably an occasional flier; no flight records.

Biology: Unknown.

General range: An eastern and central species. Northeast to northern New Brunswick, in Québec in the extreme southwest near the Vermont border, southern Ontario northwest to Michigan, Minnesota, North Dakota, west to Iowa, Missouri, southwest to Texas, south to Kentucky and Virginia.

Maine localities (7): Batchelders Grant Township (UVM), Carrabassett Valley (PVT), Hancock (CNC), Mount Desert (PROC, UVM), Newry (UVM), Vassalboro (PVT), Winslow (PVT).

***Bembidion levettei* Casey (Plate 14)**

Habitat: On bare sand along lakes, rivers, and brooks.

Flight dynamics: Fully winged, a day flier.

Biology: Diurnal, a large-eyed predator that is active in sunlight, flies when disturbed.

General range: Northern transcontinental species. Northeast to Newfoundland and Labrador, in Québec north to Abitibi, in Ontario north to Hudson Bay, in the Northwest Territories to Great Slave Lake and Aklavik near the mouth of the Mackenzie River, in Alaska west to Russian Mission on the lower Yukon River, to the south coast near Anchorage, south to Washington, Colorado, North Dakota, Minnesota, Wisconsin and Michigan, southern Ontario, New York, southern Québec (Montreal, Sherbrooke), northern New Hampshire, isolated record from northern Vermont, and northern Maine.

Maine localities (6): Chain of Ponds Township (CNC), Eustis (CNC), Garfield Plantation (MFS), Cathance Township (RPWC), T3 R8 WELS (RENS), T8 R14 WELS (PVT).

***Bembidion levigatum* Say (record from Majka et al. (2011)) (Plate 14)**

Habitat: Fine sand to muddy or clayey banks of rivers, with little to no vegetation, generally on moist to wet substrates.

Flight dynamics: Fully winged, taking flight when disturbed; also attracted to artificial lights at night.

Biology: General adults appear in late July into August, overwintering as adults. Egg-laying seasonality apparently unknown, but probably a spring breeder.

General range: East of the Rockies, generally distributed in the USA, south from Montana through Wyoming and Colorado to New Mexico, east across Texas, Alabama and Florida, north to New York and New Hampshire, and Maine.

Maine localities (1): Mt. Vernon (MFS).

***Bembidion louisella* Maddison (Plate 14)**

Habitat: On the gravel and cobble shores of clear, cold rivers.

Flight dynamics: Hind wings full; will occasionally fly if approached on a sunny day, even if temperatures are cool.

Biology: Unknown.

General range: Restricted to Canadian Maritimes and northern New England, from Newfoundland west along the lowest St. Lawrence Valley, the Gaspé Peninsula of Québec, New Brunswick, Nova Scotia, Maine, and New Hampshire.

Maine localities (9): Allagash (Maddison), Bangor (Maddison), Brewer (Maddison), Gilead (Maddison), Mexico (Maddison), Squapan Township (Maddison), Eustis (Maddison), T2 R10 WELS (Maddison), Trout Brook Township (Maddison).

***Bembidion mimus* Hayward (Plate 14)**

Habitat: On bare mud in many situations: shores, muddy spots in bogs, wet mud in fields and to the summits of the highest mountains.

Flight dynamics: Fully winged, light trap and other flight observations.

Biology: Diurnal. Makes dispersal flights in spring.

General range: A northeastern species, east of the Great Plains. Northeast to Newfoundland, in Québec north to Abitibi and Lac St. Jean, in Ontario north to north shore of Lake Superior, in Manitoba west to southwestern corner of province, west to South Dakota, south to Iowa, northern Illinois, Ohio, West Virginia, Pennsylvania, New York, and Connecticut.

Maine localities (8): Edmunds Township (CNC), Eliot (RPWC), Eustis (CNC), Monmouth (CNC), Sanford (CNC), T9 R5 WELS (UNH), Waterville (RENC), Wayne (CNC).

***Bembidion muscicola* (Hayward) (Plate 14)**

Habitat: In shaded areas near pools or wet areas, among fallen leaves or mosses.

Flight dynamics: Wings dimorphic, in light trap records.

Biology: Reported to feed on mosquito eggs.

General range: Northeast to Cape Breton Island in Nova Scotia and New Brunswick, in Québec north to Saguenay River and Lake Matagami, northwest to vicinity of Saskatoon, Saskatchewan, Wisconsin and northern Illinois, south to New York and Massachusetts.

Maine localities (10): Blanchard Township (RENC), Canaan (RENC), Lebanon (CNC), Orono (UNH), Pittston Academy Grant (RPWC), Scarborough (PVT), T5 R18 WELS (RPWC), Waterville (RENC), Wayne (CNC), Winslow (RENC).

***Bembidion mutatum* Gemminger and Harold (Plate 15)**

Habitat: Dry, open areas, such as sand pits, borders of roads, waste ground; in the more southern part of the range, it may be found on bare mountain tops, sometimes under dry clumps of moss on barren, smooth bedrock.

Flight dynamics: Dimorphic species, no flight records.

Biology: Unknown.

General range: A transcontinental northern species. Northeast to Newfoundland, in Québec north to the North Shore, to Lac St. Jean and Chibougamou, in Ontario north to Cochrane and north shore of Lake Superior, in Manitoba north to the Pas, in the Northwest Territories north to the Hay River, in Yukon north to Dawson City, in Alaska west to Circle and Tanana, in the interior of British Columbia west to Vanderhoof, not south of the international border on the Great Plains, but in the east, found south into Wisconsin and Michigan; in Ontario, south to Ottawa; in southern Québec, south to the latitude of Montreal, relict populations in mountains of northern New York, Vermont, New Hampshire, Maine, and southern Québec.

Maine localities (1): Mt. Katahdin Township (CNC).

***Bembidion nigripes* (Kirby) (Plate 15)**

Habitat: On sand or mud along inland lakes or pools or on sea beaches under drift material, often under algal crusts in dried tidal pools in salt marshes.

Flight dynamics: Fully winged, in light trap records.

Biology: Teneral in August, adult hibernation.

General range: Apparently a Holarctic species, though the only confirmed Old World record is from Lake Baikal. In North America, Northeast to Newfoundland and Labrador, in Québec north to Schefferville and Ft. George, in Ontario north to Cochrane, in Manitoba north to Churchill on Hudson Bay, in the Northwest Territories north to Aklavik and Reindeer Depot, in the Yukon north to Dawson, in Alaska west to Rampart and south to the Kenai Peninsula, west to the Pacific Ocean and British Columbia, south

to Oregon and Idaho, south in the mountains to New Mexico, in the Great Plains south to South Dakota, south to Minnesota, Michigan, Pennsylvania, New York, and Maine.

Maine localities (2): Jackman (CNC), Steuben (CNC).

***Bembidion nigrivestis* Bousquet (Plate 15)**

Habitat: damp to wet leaf litter or moss in forested environments, either near vernal pools or along small streams; often accompanied by *Bembidion semicinctum* Notman.

Flight dynamics: Unknown

Biology: Wing-dimorphic, but most (49/51) specimens so far examined were brachypterous.

General range: New Brunswick, west across southern Québec and Ontario to southeastern Manitoba and eastern Minnesota, south to New Hampshire and Maine.

Maine localities (5): Bar Harbor (UNH), Camden (UNH), Monmouth (MCZ), Orono (UNH), T17 R4 WELS (MCZ).

***Bembidion nigrum* Say (Plate 15)**

Habitat: Sand and gravel banks on rivers and brooks, usually in sun-exposed areas rather than in densely shaded areas, in Vermont up to 500 m elevation.

Flight dynamics: Fully winged, in light trap records.

Biology: Teneral individuals in mid-August.

General range: An eastern and central North American species. Northeast to Nova Scotia and New Brunswick, in Québec north to Montreal and Québec City, in Ontario north to Georgian Bay, north to Michigan and Minnesota, west to South Dakota, and Iowa, south to Arkansas, Kentucky, and Georgia.

Maine localities (43): Adamstown Township (CNC), Alder Stream Township (CNC), Andover (CNC), Anson (CNC, PVT), Appleton (CNC), Auburn (CNC), Batchelders Grant Township (UVM, RENC), Berwick (CNC), Brownville (CNC), Caratunk (RENC), Carrabassett Valley (UVM), Chain of Ponds Township (CNC), Comstock Township (RPWC), Cornish (RPWC), Embden (RPWC), Fryeburg (RENC), Garfield Plantation (MFS), Gilead (CNC, RENC), Grafton Township (CNC), Lewiston (MFS), Lincoln Plantation (RPWC), Madrid Township (CNC), Mexico (CNC), Moscow (RENC), Mount Katahdin Township (CNC, RENC), Nesourdnahunk Township (CNC), New Sharon (RENC), Newry (CNC, RENC), Norridgewock (RENC), Parlin Pond Township (CNC), Pittston Academy Grant (RPWC), Skowhegan (RENC), Squapan Township (CNC), Stoneham (RENC), Strong (RENC), T2 R9 WELS (RENC), T3 R10 WELS

(CNC), T4 R10 WELS (CNC), T5 R18 WELS (RPWC), T5 R9 WELS (CNC), Unity (RENC), Waterville (RENC), Weld (CNC).

***Bembidion nitidum* (Kirby) (Plate 15)**

**Habitat:** On dry, open, often sandy soil, either bare or partly vegetated, frequent in sand pits, sometimes common in cultivated fields.

**Flight dynamics:** Fully winged, light trap records.

**Biology:** Teneral adults during mid-July.

**General range:** An east-central species, east of the Rockies. Northeast to New Brunswick, in Québec north to Lac St. Jean and Abitibi (not on the Gaspé), in Ontario north to Cochrane and Lake Nipigon, in the prairie provinces, north to Saskatoon and Edmonton, in the Northwest Territories, north to Ft. Smith, in the Yukon Territory north to White River, west to Alaska and British Columbia, absent from West Coast states but south in the Rocky Mountains to Colorado, south to South Dakota, Missouri, Wisconsin, Indiana, New York (south to Buffalo and the Adirondacks) and Massachusetts.

**Maine localities (2):** Mechanic Falls (RENC), Waterford (RENC).

***Bembidion oberthueri* Hayward (Plate 15)**

**Habitat:** Sandy river banks, usually on medium-sized and large rivers, where it occurs on the upper parts of sand banks, often in sparse vegetation. Has been taken in beaver houses.

**Flight dynamics:** Fully winged, no actual flight records but occasional mountain-top specimens probably flew there.

**Biology:** Teneral adults have been observed from mid-August to mid-October.

**General range:** An eastern and central species. Northeast to New Brunswick, in Québec limited to St. Lawrence Valley and eastern townships, north to Québec City, west to the Rocky Mountains, north to Winnipeg and about 160 km north of Edmonton, south to Wyoming, Nebraska, Iowa, Illinois, Ohio, and Pennsylvania.

**Maine localities (6):** Auburn (CNC), Coplin Plantation (RPWC), Embden (RPWC), Grand Isle (CNC), Lewiston (MFS), Mexico (CNC).

***Bembidion obscurellum* (Motschulsky) (Plate 15)**

**Habitat:** On bare sand or mud, both near and away from water, common in cultivated fields, disturbed deposits of sand, often at road repair sites, dumps, sites of recent floods.

**Flight dynamics:** Fully winged and a frequent flier; many light trap records.

**Biology:** Hibernates as adult.

**General range:** A circumpolar species. In Scandinavia, found only on drift, in northern Russia and Siberia; in North America, formerly east only

to Lake Nipigon, western Ontario, in the Northwest Territories north to Norman Wells in the Mackenzie Valley, in Alaska west to lower Yukon River and to the Kenai Peninsula on the south coast, to the west coast south to California, south to Utah, New Mexico, and Nebraska. Since 1965, it spread to the east coast; northeastern limit now is in western Newfoundland, in Québec northwest to Québec City area, southern limit now in Indiana, Ohio, New York, Maine, New Hampshire, and Vermont.

**Maine localities (1):** Topsfield (MFS).

***Bembidion occultator* Notman (Plate 15)**

**Habitat:** Muddy or grassy shores of slow sections of shaded mountain brooks and small rivers, especially at inlets of beaver ponds and under willow clumps. Usually in shaded sites.

**Flight dynamics:** Fully winged, in light trap records.

**Biology:** Teneral adults observed in July (Newfoundland).

**General range:** A transcontinental species. Northeast to Newfoundland and Labrador, in Québec north to James Bay and south only to the St. Lawrence River, except for two localities in the Québec City region, in Ontario north to Hudson Bay and south to Sudbury; western limits poorly known, but known from the Cypress Hills in extreme southeastern Alberta; in Alaska, in the Matanuska Valley; south of Canada, south to northern Michigan, isolated in the mountains of Vermont and New Hampshire.

**Maine localities (3):** Bar Harbor (PROC), Lincoln (CNC), T2 R4 WELS (CNC).

***Bembidion patruelle* Dejean (Plate 15)**

**Habitat:** Abundant on bare mud or muddy sand on rivers and ponds, especially common along margins of beaver ponds, common in the mountains of New England up to 900 m elevation.

**Flight dynamics:** Fully winged, in light trap records.

**Biology:** Adults fly from late June into July, teneral adults appear in mid-July to August.

**General range:** A transcontinental species. Northeast to Newfoundland, in Québec north to Saguenay and James Bay, in Ontario north to Lake Nipigon, just reaching the southern border of the Northwest Territories at Ft. Smith, in British Columbia west to the Pacific, south to Oregon, Idaho, Utah, Colorado, Oklahoma, Louisiana, Mississippi, and Florida.

**Maine localities (73):** Abbot (RENC), Adamstown Township (CNC), Addison (RPWC), Albany Township (CNC), Allagash (UNH), Andover (CNC), Anson (RENC), Ashland (UNH),

Auburn (CNC, RENC), Bancroft (CNC), Bar Harbor (PROC, UVM), Baring Plantation (CNC), Batchelders Grant Township (UVM, RENC), Belgrade (RENC), Benton (RENC), Bigelow Township (UVM), Brighton Plantation (RENC), Carrabassett Valley (PVT), China (RENC), Clinton (RENC), Cutler (RPWC), Dennysville (UNH), Dixfield (RENC), Durham (RPWC), East Millinocket (CNC), Edmunds Township (CNC), Eliot (RPWC), Embden (RPWC), Eustis (CNC), Fairfield (RENC), Fryeburg (RPWC, RENC), Garfield Plantation (MFS), Gilead (RENC), Hancock (CNC), Harrington (UVM, RPWC), Jefferson (RENC), Kingsbury Plantation (RENC), Lebanon (UNH), Lee (RPWC), Lewiston (MFS), Lincoln (UNH), Long Pond Township (CNC), Lubec (RPWC), Lyman (RENC), Mercer (RENC), Mexico (CNC), Millinocket (UNH), Milo (CNC), Monmouth (CNC, RENC), Montville (RENC), Mount Desert (UVM), Mount Vernon (MFS), New Sharon (RENC), Newfield (RPWC), Newry (CNC), Oakfield (RPWC), Perkins Township (UVM), Pittsfield (RENC), Readfield (CNC), Sidney (RENC), Skowhegan (RENC), T11 R16 WELS (MFS), T12 R8 WELS (MFS), T17 R4 WELS (UNH), T2 R9 WELS (RENC), T9 R5 WELS (MFS), Troy (RENC), Unity (RENC), Washington (RENC), Waterboro (RENC), Waterville (RENC), Whiting (RPWC), Wilton (CNC).

***Bembidion petrosum petrosum* Gebler (Plate 16)**

Habitat: Barren sand banks and gravel bars along shaded mountain brooks, rivers and shores of large lakes. Also along sea beaches under rocks in freshwater seepage areas.

Flight dynamics: Fully winged, in light trap records.  
Biology: Teneral adults appear in late July to early August.

General range: A circumpolar species. In Europe, found only in northern Scandinavia and northern Russia, in northern Siberia extending in the mountain areas of central Siberia, in eastern Siberia, north of the Sea of Okhotsk. In North America, Northeast to Lake Melville, Labrador, in Québec north to Schefferville and Poste-de-la-Baleine, in Alaska north to Ft. Yukon on the Arctic Circle and west to Anvik on the lower Yukon River, west to the Pacific coast from British Columbia to California, south to Arizona and New Mexico in the mountains, south to North Dakota, Minnesota, northern Illinois, Ohio, Pennsylvania, and Massachusetts.

Maine localities (7): Auburn (RENC), Cutler (CNC), Norridgewock (RENC), Skowhegan (RENC), T3 R10 WELS (CNC), Waterville (RENC), Winslow (RENC).

***Bembidion planum* (Haldeman) (Plate 16)**

Habitat: Barren gravel banks along large and medium-sized rivers, also on gravel shores of large lakes.

Flight dynamics: Fully winged, light trap records.

Biology: Teneral adults appear from mid-July to late August.

General range: An eastern species. Northeast to Nova Scotia and New Brunswick, in Québec known from the south shore of the St. Lawrence north to Lotbinière County, in the Montreal region known from the north shore of the river and along north shore of Ottawa River to Ottawa, in Ontario north to Lake Nipigon, west to Minnesota, south to Illinois, Kentucky, Tennessee, and Virginia.

Maine localities (11): Allagash (CNC), Appleton (CNC), Garfield Plantation (MFS), Hanover (UVM), Moscow (RENC), Nesourdnhunk Township (CNC), Norridgewock (RENC), Sidney (PVT, RENC), T10 R7 WELSD (MFS), T12 R8 WELS (MFS), T3 R10 WELS (UVM).

***Bembidion postremum* Say (Plate 16)**

Habitat: Usually on sloping sand banks near water on rivers; also recorded from under willow thickets.

Flight dynamics: Fully winged, no light trap records.

Biology: Digs into the sand and many specimens can be collected by splashing sand banks with water. Many teneral specimens have been taken in mid-June.

General range: Limited range in the Northeast and north-central region. Northeast to New Brunswick and Gaspé Peninsula, in Québec also known from a limited area from Levis south into the eastern townships; in the USA, west to Wisconsin and Illinois, south to Ohio and New York, Pennsylvania, and Massachusetts.

Maine localities (1): Fort Kent (CNC).

***Bembidion praticola* Lindroth (Plate 16)**

Habitat: Under fallen leaves or mosses along temporary pools.

Flight dynamics: Dimorphic, most individuals vestigially winged.

Biology: Adult hibernation.

General range: A transamerican species. Northeastern to New Brunswick, in Québec only in the southwest, west of Montreal, in Ontario north to Lake Huron, western records from southern British Columbia and Washington, otherwise west only to Saskatchewan, south to Illinois, southern Ontario (Point Pelee), New York, Vermont, and southern New Hampshire.

Maine localities (6): Belgrade (RENC), Camden (UNH), Lewiston (MFS), Monmouth (UNH), Mount Desert (UNH), Orono (UNH).

***Bembidion properans* (Stephens) (Plate 16)**

**Habitat:** Bare unshaded ground, disturbed soil, and seashores.

**Flight dynamics:** Wings dimorphic.

**Biology:** Unknown.

**General range:** An adventive Old World species. Natural range is southern Scandinavia and most of the rest of Europe, Russia, the Caucasus, and all of Siberia except for the extreme north and high mountains. In North America, Newfoundland, Nova Scotia, New Brunswick, Prince Edward Island, Magdalen Islands, Québec. The record from Maine is the only US record.

**Maine locality (1):** Cutler (CNC).

***Bembidion pseudocautum* Lindroth (Plate 16)**

**Habitat:** Usually found among leaves and mosses along small shaded streams in deciduous and mixed forests, or at the borders of eutrophic marshes and swamps with cattails and willows.

**Flight dynamics:** Fully winged, occasionally attracted to lights.

**Biology:** Hibernation as adult.

**General range:** A nearly transcontinental species, but barely reaching the Atlantic coast, and not reaching the Pacific. The easternmost records are from New Brunswick. In Québec, in the St. Lawrence Valley to just beyond Québec City, in the prairies north to Winnipeg, Manitoba and Saskatoon, Saskatchewan, in Alberta recorded only from the Cypress Hills in the extreme southeast, in British Columbia west to Shuswap Lake and the Okanagan Valley, south to Montana, Minnesota, Michigan, Ohio, Pennsylvania, New York, and Connecticut.

**Maine localities (6):** Baring Plantation (CNC), Belgrade (RENC), Edmunds Township (CNC), Nesourdnahunk Township (CNC), Sanford (CNC), Waterboro (RENC, RPWC).

***Bembidion punctatostriatum* Say (Plate 16)**

**Habitat:** Barren sand and mud banks along large rivers.

**Flight dynamics:** Fully winged, active diurnally and takes flight when disturbed.

**Biology:** A large-eyed, diurnal predator; hibernates as adult.

**General range:** A transcontinental species. Northeast to New Brunswick, in Québec north to the Saguenay River, and to Hull, in the prairies north to Saskatoon and Edmonton, recorded also from the Yukon, in British Columbia west to Vancouver, south to Montana, Minnesota, Missouri, Arkansas, Kentucky, Ohio, Pennsylvania, New York, and Connecticut.

**Maine localities (10):** Allagash (CNC), Anson (RENC), Embden (RPWC), Magalloway Planta-

tion (RPWC), Mercer (RENC), New Sharon (RENC), Norridgewock (RENC), Paris (CNC), Sidney (RENC), T3 R7 WELS (CNC).

***Bembidion quadratum* Notman (Plate 16)**

**Habitat:** In sphagnum bogs, usually near open water. Adults occur on patches of brown peat and in green sphagnum along margins of bog ponds.

**Flight dynamics:** Fully winged, in light trap records.

**Biology:** Unknown.

**General range:** A northeastern species. Northeast to Newfoundland, in Québec north to the North Shore, Saguenay River and Mt. Tremblant region; in the USA, south to the Adirondack Mountains, and to Connecticut, Vermont, and New Hampshire.

**Maine localities (7):** Bancroft (CNC), Bar Harbor (UNH), Columbia (PVT, RPWC), Gouldsboro (PVT), Mount Katahdin Township (MCZ), Southwest Harbor (PROC), T19 MD BPP (RPWC).

***Bembidion quadrimaculatum oppositum* Say (Plate 17)**

**Habitat:** Bare soil of almost any description, including gardens, croplands, dirt roads, trails, gravel pits, drier parts of shores, waste ground; also on bare, exposed rock ledges.

**Flight dynamics:** Fully winged, in light traps records.

**Biology:** Diurnal; eats eggs and small larvae of other insects; hibernates as adult.

**General range:** In North America, east of the Rocky Mountains. Another subspecies (*Bembidion quadrimaculatum dubitans* (LeConte)) is found in North America west of the Rockies and four others in Europe and across Asia. This subspecies is found northeast to Newfoundland, in Québec to the North Shore and James Bay, in Ontario north to Moose Factory, northwest to Fort McMurray, west to South Dakota, Nebraska and Kansas, south to Texas, Missouri, Tennessee, and Georgia.

**Maine localities (37):** Albany Township (CNC), Albion (RENC), Athens (RENC), Caribou (MFS), Carrabassett Valley (CNC), Charleston (RENC), Fairfield (PVT, RENC), Fort Fairfield (MFS), Fryeburg (CNC, RPWC, RENC), Garfield Plantation (MFS), Georgetown (MFS), Gilead (RENC), Lebanon (CNC), Lewiston (MFS), Limerick (CNC), Lincoln Plantation (CNC), Magalloway Plantation (RPWC), Mechanic Falls (RENC), Montville (RENC), Morrill (PVT), Moscow (RENC), Mount Desert (PROC, MFS), Mount Vernon (MFS, RENC), Norridgewock (RENC), Orono (MFS), Orrington (MFS), Oxbow Plantation (MFS), Presque Isle (MFS), T3 R8 WELS (MFS, RENC), T6 R11

WELS (UVM), Turner (RENC), Unity (RENC), Washburn (RENC), Waterford (RENC), Waterville (PVT, RENC), Winslow (RENC).

***Bembidion rapidum* LeConte (Plate 17)**

Habitat: On muddy sand along rivers and lakes.

Flight dynamics: Fully winged, light trap records from the Midwest, a frequent flier.

Biology: Probably a recent invader to the eastern states, records from New England are from 1963 or later.

General range: A transcontinental species except for the Northwest, rare in the Northeast. East to New Brunswick, in Québec north to Bellechasse Co. east of Québec City and to the Abitibi region, in Ontario north to Lake Nipigon, in the southern Canadian prairies to Lethbridge, southern Alberta, west to Montana, Wyoming, Utah and California, south to Arizona, Texas, Louisiana, and Georgia.

Maine localities (5): Biddeford (PVT), Cutler (CNC), Ogunquit (CNC), Readfield (CNC), Township C (MFS).

***Bembidion rolandi* Fall (Plate 17)**

Habitat: Shores of rivers and large lakes, on gravel bars. Adults are usually found several inches deep in the gravel.

Flight dynamics: Fully winged, in light trap records.

Biology: Unlike its relative *B. planum*, it is rarely collected by splashing gravel with water. When threatened, it rushes into shallow water where it hides under stones.

General range: A northeastern species, largely Appalachian. Northeast to Nova Scotia and New Brunswick, in Québec northeast to Québec City region and Montreal, in Ontario north to Ottawa, south to Ohio, Virginia, West Virginia, New York, Vermont, and Maine.

Maine localities (2): Allagash (CNC), Anson (CNC).

***Bembidion rothfelsi* Maddison (Plate 17)**

Habitat: Gravel bars and islands in smaller rivers and creeks.

Flight dynamics: Fully winged, readily takes flight when disturbed.

Biology: Unknown; adults abundant at type locality (Vermont) on 11 July.

General range: Nova Scotia and New Brunswick west across southern Québec to southeastern Ontario, southwest to Illinois, Missouri and western Mississippi, east of the Appalachians known only south to North Carolina.

Maine localities (14): Berwick (Maddison), Bethel (Maddison), Greenville (Maddison), Greenwood (Maddison), Mexico (Maddison), Newry (Maddison), Anson (Maddison), Paris (Maddison), Eustis (Maddison), T2 R10

WELS (Maddison), T5 R18 WELS (Maddison, RPWC), T5 R9 WELS (Maddison), Trout Brook Township (Maddison), Weld (Maddison).

***Bembidion rusticum rusticum* Casey (Plate 17)**

Habitat: Usually on barren gravel or sand bars, sometimes in finer substrates, along running waters of all kinds.

Flight dynamics: Fully winged, in light trap records.

Biology: Hibernates as adult.

General range: A northeastern subspecies. Another subspecies (*Bembidion rusticum lenensoides* Lindroth) is found in northwestern Canada and Alaska and eastern Siberia as far west as Mongolia. This subspecies is found northeast to southern Labrador, in Québec north to Anticosti Island, along both sides of the St. Lawrence River to Montreal but not farther west, south to Pennsylvania and Massachusetts.

Maine localities (16): Allagash (CNC), Appleton (CNC), Batchelders Grant Township (RENC), Eustis (CNC), Grafton Township (CNC), Madrid Township (CNC), Moscow (RENC), Mount Katahdin Township (RENC), Nesourdnhunk Township (CNC), Pittston Academy Grant (RPWC), Sandy Bay Township (CNC), T10 R7 WELS (MFS), T11 R16 WELS (MFS), T12 R8 WELS (MFS), T3 R10 WELS (CNC), Waterville (RENC).

***Bembidion salebratum* LeConte (Plate 17)**

Habitat: This species occurs in bare gravel, sand or even clay, along streams and rivers. In Vermont, however, it is restricted to the wet gravel or sand at the margin of Lake Champlain where *B. nigrum* is very rare, but the two species are often found together in comparable abundance in New Brunswick.

Flight dynamics: Fully winged, in light trap records.

Biology: Hibernates as adult.

General range: A northeastern and north-central species. Northeast to Newfoundland, in Québec north to James Bay, in Ontario north to Lake Cochrane and Lake Nipigon, northwest to extreme northeastern British Columbia, west to Idaho, Wyoming, south to South Dakota, Iowa, Wisconsin, Michigan, southern Ontario, Pennsylvania, New York, Vermont, and New Hampshire.

Maine localities (7): Brownville (CNC), Connor Township (CNC), Fort Kent (CNC), Readfield (CNC), Cathance Township (RPWC), Trout Brook Township (CNC), Weld (CNC).

***Bembidion scopulinum* (Kirby) (Plate 17)**

Habitat: On bare, shaded sand or gravel bars, commonest on rushing mountain brooks up to 1,250 m, also on the shores of Lake

Champlain associated with *B. salebratum*, rare along lowland rivers. Can be common in freshwater seepage areas near salt marshes and sea beaches.

Flight dynamics: Wings polymorphic, flight records of macropterous specimens in Newfoundland.

Biology: Teneral adults appear from June into August; hibernates as adult.

General range: A nearly circumpolar species. Absent from Europe but widespread throughout Siberia. In North America, Northeast to southern Labrador, in Québec north to Hudson Bay, in the Northwest Territories north to Hay River on the south shore of Great Slave Lake, in the southern Yukon north to Dawson, in Alaska west to Ft. Yukon and Anchorage, west to British Columbia, south to Oregon, Idaho, New Mexico, South Dakota, Minnesota, Illinois, Ohio, Pennsylvania, and New York.

Maine localities (34): Addison (RPWC), Allagash (UNH), Anson (CNC), Appleton (CNC), Bar Harbor (PROC, UNH), Caratunk (RENC), Carrabassett Valley (PVT, UVM), Chain of Ponds Township (CNC), Connor Township (CNC), Cutler (CNC), East Millinocket (CNC), Edmunds Township (CNC), Fort Kent (CNC), Garfield Plantation (MFS), Hancock (CNC), Millinocket (UNH), Mount Desert (UVM), Mt. Katahdin Township (RENC), Nesourdnahunk Township (CNC), Newry (UVM), Parlin Pond Township (CNC), Pittston Academy Grant (RPWC), Squapan Township (CNC), T10 R7 WELS (MFS), T15 R13 WELS (CNC), Cross Lake Township (UNH), T3 R10 WELS (CNC), T3 R11 WELS (RENC), T3 R8 WELS (RENC), T4 R10 WELSD (CNC), T5 R9 WELS (CNC), T8 R5 WELS (CNC), Waterville (RENC), West Forks Plantation (PVT).

***Bembidion sejunctum sejunctum* Casey (Plate 17)**

Habitat: On dry sand on upper margins of sea beaches; the Great Plains population is on sand of intermittent streams on the short grass prairie and on sand dunes.

Flight dynamics: The Great Plains population is wing dimorphic; eastern populations are constantly brachypterous with flight wings shorter and narrower than an elytron.

Biology: By day it hides under drift and rocks well above the high-tide line.

General range: A species known from three widely separated areas. This subspecies occurs on the sea beach from easternmost Maine to Labrador and in the Great Plains from New Mexico to Alberta; another subspecies (*Bembidion sejunctum semiaureum* Fall) is found on the west coast from California north to British Columbia.

Maine localities (1): Lubec (PVT, RENC).

***Bembidion semicinctum* Notman (Plate 17)**

Habitat: Among fallen leaves or in mosses and sedges near small streams, vernal ponds and pools, and beaver ponds, often common under alders and willows in these habitats.

Flight dynamics: Normally vestigially winged, flight wings reduced to tiny scales (Lindroth 1963), though long-winged individuals have been encountered in flight in the spring in New Brunswick.

Biology: Teneral individuals appear in mid-August.

General range: A northeastern species. Northeast to Nova Scotia and New Brunswick, in Québec extending down St. Lawrence valley beyond Québec City, in Ontario north to Ottawa and west to Simcoe, west to Michigan, south to Pennsylvania, New Jersey, and Connecticut.

Maine localities (11): Belgrade (RENC), Fairfield (RENC), Grand Isle (CNC), Mount Desert (UVM), Mount Vernon (MFS), Oakland (RENC), Sidney (RENC), T2 R4 WELS (CNC), Waterford (RPWC), Wayne (CNC), Whiting (CNC).

***Bembidion semistriatum* Haldeman (Plate 17)**

Habitat: In gravel banks along lightly shaded brooks and small rivers, absent from deeply shaded forest brooks and rare along larger rivers. Sometimes abundant in rock crevices in gorges.

Flight dynamics: Fully winged, no flight records.

Biology: Teneral adults appear from July to September.

General range: An Appalachian species. Northeast to Nova Scotia and New Brunswick, in Québec in the eastern townships and along the St. Lawrence River nearly to Québec City, west to Ontario, Indiana, Kentucky, and Tennessee, south to Alabama and Georgia.

Maine localities (17): Appleton (CNC), Batchelders Grant Township (RENC), Berwick (CNC), Edmunds Township (CNC), Lewiston (MFS), Mexico (CNC), Moscow (RENC), Nesourdnahunk Township (CNC), Newry (CNC), Perkins Township (UVM), Pittston Academy Grant (RPWC), Sidney (RENC), Stoneham (RENC), Waterford (RPWC, RENC), Waterville (RENC), Whitefield (RENC), Winslow (RENC).

***Bembidion simplex* Hayward (Plate 18)**

Habitat: Bare gravel bars along rushing mountain streams. This species is most common in headwater streams where the water is coldest and the banks heavily shaded. It ascends the mountains to the highest permanent streams.

Flight dynamics: Fully winged, no flight records.

Biology: Teneral specimen seen 23 July; apparently hibernation as adult.

General range: An Appalachian species. Northeast to northwestern Maine, in Québec north to Brome Lake in the eastern townships and to Quyon in far western Québec. This species prefers hill and mountain slopes and is probably absent from the nonmountainous regions of the eastern townships and the Montreal area. South to Ohio, West Virginia, Virginia, Tennessee, and North Carolina.

Maine localities (4): Grafton Township (CNC), Newry (UVM), Sandy Bay Township (CNC), T5 R9 WELS (CNC).

***Bembidion stephensii* Crotch (Plate 18)**

Habitat: Seeps on sloping banks along streams or sea coasts, often on clay-rich substrates.

Flight dynamics: Fully winged, in light trap records.

Biology: Breeds in springtime, hibernates as adult.

General range: An Old World species, adventive in North America before 1891. In Central Europe, north to southern Scandinavia, west to the British Isles, south to northern Spain and Italy, Bosnia, and Bulgaria, east to European Russia. In the North America, Northeast to Newfoundland, in Québec north to Lac St. Jean, west to Ottawa, Ontario and Ohio, south to Virginia.

Maine localities (2): Cutler (CNC), Hancock (CNC).

***Bembidion tetracolum* Say (Plate 18)**

Habitat: Bare soil, in gardens, croplands and along larger rivers, usually on moister fine-grained substrates with scattered vegetation. Definitely favored by human disturbance.

Flight dynamics: Wings dimorphic, light trap records.

Biology: Teneral adults appear from July into September.

General range: An Old World species, adventive into North America before 1700. North to central Sweden, southern Norway, west through the British Isles, south to southern Spain, Italy and Greece, east to western Siberia and Kyrgyzstan, south to the Caucasus. In North America, Northeast to Newfoundland, in Québec north to Lac St. Jean and Abitibi, in Ontario west to Lake Huron; in the USA, west to South Dakota, south to Texas, Tennessee, and North Carolina.

Maine localities (9): Auburn (RENC), Camden (CNC), Cutler (CNC), Eustis (MFS), Fort Kent (UVM), Lewiston (MFS), Orono (MFS), Southwest Harbor (PROC), Winslow (PVT).

***Bembidion transparens* Gebler (Plate 18)**

Habitat: Strongly hygrophilous, among sedges and wet mosses near eutrophic or mesotrophic pools, lakes, or beaver ponds.

Flight dynamics: Wings dimorphic, fully winged forms observed in flight and at light traps.

Biology: Teneral adults appear in late summer, hibernates as adult.

General range: A Holarctic species. Northeast to Labrador, in Québec north to James Bay, in the Northwest Territories north to Aklavik, in Alaska west to the Yukon River Delta and south to the Kenai Peninsula, in British Columbia west to Vancouver Island, south to Oregon, Montana, Nebraska, Minnesota, Indiana, Ohio, Pennsylvania, and Massachusetts.

Maine localities (5): Blanchard Township (RENC), Cutler (CNC), Eustis (CNC), Milo (CNC), T9 R5 WELS (MFS).

***Bembidion variegatum* Say (Plate 18)**

Habitat: River banks and borders of ponds in mud or clay, bordering oxbows and beaver ponds.

Flight dynamics: Fully winged, no flight records.

Biology: Unknown.

General range: An eastern and central North American species. Northeast to New Brunswick, in Québec north to Arthabaska Co., in Ontario north to Grand Bend, west to South Dakota, Kansas and Texas, south to Louisiana, Alabama, and Georgia.

Maine localities (4): Bar Harbor (PROC), Chesuncook Township (MFS), Mount Desert (PROC), Mt. Vernon (MFS).

***Bembidion versicolor* LeConte (Plate 18)**

Habitat: Bare mud in many habitats, shores of streams, lakes and ponds, muddy areas in bog, gardens and croplands when surface is moist; has been taken in beaver lodges and amid cat-tails. Found at all elevations, including the highest mountains.

Flight dynamics: Fully winged, a frequent flier, abundant at light traps and will fly to escape on warm days.

Biology: Hibernation as adult.

General range: A transcontinental species. Northeast to Newfoundland and Labrador, in Québec north to Schefferville and Ogoki, in Ontario north to Nunavut, west to central Alaska and the Pacific coast of British Columbia, including the Queen Charlotte Islands, south to Washington, Idaho, Colorado, South Dakota, Iowa, Kentucky, Georgia, and Florida.

Maine localities (76): Albany Township (CNC), Allagash (UNH), Andover (CNC), Ashland (UNH), Auburn (RPWC), Augusta (UNH), Bancroft (CNC), Bar Harbor (PROC), Baring Plantation (CNC), Batchelders Grant Township (RENC), Belgrade (RENC), Carrabasset Valley (CNC, PVT), Chain of Ponds Township (CNC), China (RENC), Columbia (RENC), Columbia Falls (MFS), Comstock Township (RPWC), Coplin Plantation (RPWC), Cornish (CNC), Cutler

(CNC), Dennistown Plantation (UNH), Durham (RPWC), East Millinocket (CNC), Edmunds Township (CNC), Eustis (CNC), Fairfield (RENC), Fort Kent (CNC), Franklin (UNH), Fryeburg (RPWC), Garfield Plantation (MFS), Grand Isle (CNC), Greenville (UNH), Lebanon (UNH), Lewiston (MFS), Limerick, CNC, Lincoln (UNH), Lincoln Plantation (CNC, RPWC), Litchfield (CNC), Lyman (RENC), Mexico (CNC), Monmouth (UNH, RENC), Montville (RENC), Mount Desert (UVM, Mt. Vernon (MFS, RENC), Newfield (RPWC), Newry (CNC), Oakfield (RPWC), Pittston Academy Grant (RPWC), Rangeley (UNH), Readfield (CNC), Reed Plantation (CNC), Rumford (CNC), Saint Francis (CNC), Sanford (CNC), Sidney (RENC), Skowhegan (RENC), Steuben (UVM), T11 R14 WELS (UNH), T17 R4 WELS (UNH), T17 R5 (MFS), T2 R9 WELS (RENC), T4 R10 WELS (CNC), T5 R18 WELS (RPWC), T9 R5 WELS (UNH), Troy (RENC), Unity (RENC), Waterboro (RPWC, RENC), Waterville (PVT, RENC), Wayne (CNC), Wilton (CNC), Winslow (RENC).

***Bembidion versutum* LeConte (Plate 18)**

**Habitat:** On sand or mud, especially on mixed sand and mud along slow streams, often among sedges. Especially common on small deltas where streams enter beaver ponds, sometimes in beaver lodges.

**Flight dynamics:** Fully winged, in light trap records.

**Biology:** Unknown.

**General range:** An eastern species. Northeast to New Brunswick, in Québec north to Gaspé, North Shore, and Abitibi, in Ontario north to Lake Nipigon, west to Minnesota, south to Wisconsin, Michigan, Ohio, New Jersey, and Connecticut.

**Maine localities (6):** Auburn (CNC), Fryeburg (CNC), Mount Vernon (MFS), Oakfield (RPWC), T12 R8 WELS (MFS), Whiting (RPWC).

***Bembidion wingatei* Bland (Plate 18)**

**Habitat:** Usually found under partly buried stones or logs, commonly in mountain forests and other forest types, but also above treeline; it is particularly abundant in crevices on the summit of Mt. Mansfield, Vermont.

**Flight dynamics:** Vestigially winged.

**Biology:** Teneral adults from both late June and October, probably overwinters as adult or larva.

**General range:** A northeastern species. Northeast to Newfoundland and southern Labrador, in Québec north to Gaspé, entire North Shore, Anticosti Island, Ft. George, and Hudson Bay, in Ontario northwest to Lake Nipigon, west to Wisconsin, south to Illinois, Indiana, Ohio, Pennsylvania, and New York, and south in the

mountains through Virginia to Kentucky and North Carolina.

**Maine localities (8):** Camden (CNC), Cape Elizabeth (PVT, RENC), Carrabassett Valley (PVT, RENC), Edmunds Township (CNC), Lewiston (MFS), Mount Desert (UVM), Mount Katahdin Township (RENC), Sandwich Academy Grant Township (MFS).

**Subtribe Xystosomina**

**Genus *Mioptachys***

***Mioptachys flavicauda* (Say) (Plate 35)**

**Habitat:** Under bark of fallen trees and branches, in shaded, relatively humid conditions.

**Flight dynamics:** Fully winged, recorded in flight.

**Biology:** Hibernates as an adult.

**General range:** A transcontinental species. Northeast to New Brunswick and Nova Scotia, in Québec north to Berthierville, north to Michigan, Wisconsin, Minnesota, northwest to North Dakota, west to South Dakota, Nebraska, Iowa, Missouri, Arkansas. Texas, the Gulf Coast, and Florida; isolated population on Pacific Coast from British Columbia to California; some records from Arizona and New Mexico, absent from arid regions of the continental interior.

**Maine localities (7):** Augusta (UNH), Bar Harbor (PROC, UNH), Belgrade (RENC), Lebanon (UNH), Lewiston (MFS), Madison (RENC), Scarborough (RENC).

**Subtribe Tachyina**

**Genus *Tachyta***

***Tachyta angulata* Casey (Plate 45)**

**Habitat:** Under bark, usually of dead and dying conifers.

**Flight dynamics:** Documented in wind-drift debris on a lakeshore; this and the ephemeral habitat are consistent with flight being a normal means of dispersal; Bousquet (2010) noted it is fully winged but did not indicate whether flight was possible.

**Biology:** Teneral adults occur in early spring, but adults may be found year-round.

**General range:** A nearly transcontinental, predominantly more northern species of the coniferous forests. Northeast to Nova Scotia, including Cape Breton Island, and New Brunswick, south along the Appalachian Mountains to South Carolina, otherwise south to New Jersey, New York, and Pennsylvania in the East, west from Maine, New Hampshire, and Vermont across New York, Québec and Ontario to Michigan and Minnesota; not known from North Dakota or south in the central USA, but south into Montana in the West, with isolated alpine

records in Arizona and New Mexico; west to British Columbia (though apparently not reaching the coast) and north to the southern Yukon Territory, but not yet recorded from Alaska.

Maine localities (9): Belgrade (RENC), Buckfield (RENC), Fairfield (RENC), Fryeburg (RPWC), Madison (RENC), Sidney (RENC), Steuben (UVM), Waterville (RENC), York (RENC).

***Tachyta inornata* (Say) (Plate 45)**

Habitat: Under bark of dry logs or standing snags, at least of coniferous species.

Flight dynamics: Fully winged, daytime flight observed.

Biology: Unknown.

General range: A transcontinental species. Northeast to Maine, in Québec north to the Eastern Townships and Montreal, and in the Ottawa Valley of southern Ontario, northwest to northern Wisconsin to the shore of Lake Superior, west to North Dakota, Montana, Idaho, southern British Columbia, and Washington, south into Oregon, California, southwest to Arizona, New Mexico, and Texas, and eastwards across Louisiana, Alabama, Florida, and Georgia; south in the mountains to Mexico, Guatemala, Belize, and extreme western Cuba. Another species (*Tachyta kirbyi* Casey) is found generally north of this species, though they overlap considerably in range.

Maine localities (5): Bar Harbor (PROC), Madison (RENC), Mount Desert (UNH), Passadumkeag (UNH), Waterboro (RENC).

***Tachyta kirbyi* Casey (Plate 45)**

Habitat: Under bark of dry fallen logs and snags.

Flight dynamics: Fully winged, no flight records.

Biology: Unknown.

General range: A transcontinental species but largely farther north than preceding species, although they overlap extensively. Northeast to Maine, in Québec north to the Gaspé, Lac St. Jean and Abitibi, in Ontario north to Sudbury and Rainy River, in Alberta north to Edmonton, in British Columbia west of Vancouver, south to Washington and Oregon, Idaho, Montana, North Dakota, Minnesota, Wisconsin, New York, Massachusetts, and New Hampshire.

Maine localities (4): Benton (RENC), Bigelow Township (UVM), Lewiston (MFS), York (PVT).

***Tachyta parvicornis* Notman (Plate 45)**

Habitat: Under bark of pitch pine and other conifers.

Flight dynamics: Fully winged, no light trap records.

Biology: Teneral adults appear from April to July, and in September; overwinters in part in the adult stage.

General range: A widespread, more southern species, not reaching the West Coast. Northeast to

southern Maine, south along eastern coastal states from Massachusetts to Maryland, farther south extends farther inland, north to northern Virginia, western North Carolina, central Alabama and Florida, west along the Gulf of Mexico coast to south-central Texas, north in the Rockies to Colorado and west to the mountains of Arizona.

Maine locality (1): York (PVT).

**Genus *Elaphropus***

***Elaphropus anceps* (LeConte) (Plate 29)**

Habitat: Bare mud, either wet or partly dry, along margins of rivers and lakes, in gardens, cultivated fields, gravel pits, and along paths.

Flight dynamics: Fully winged, no flight records.

Biology: Unknown.

General range: An eastern and central North American species. Northeast to Cape Breton Island in Nova Scotia and New Brunswick, in Québec on the south side of the Gaspé, and north of the Vermont border, in Belleville, Ontario on Lake Ontario, and Bayfield on Lake Huron, across the prairie provinces to Winnipeg, Manitoba, Saskatoon, Saskatchewan, and Medicine Hat, Alberta; also an isolated record from Hay River, Northwest Territories; west to British Columbia, Washington, and Oregon, south to Arizona, New Mexico, Kansas, Missouri, Kentucky, Alabama, West Virginia, and Maryland.

Maine localities (30): Albany Township (CNC), Anson (CNC), Auburn (CNC), Belgrade (RENC), Berwick (CNC), Buxton (RENC), Charleston (RENC), Clinton (RENC), Cutler (CNC), Fairfield (PVT, RENC), Fort Kent (CNC), Fryeburg (CNC), Hancock (CNC), Leeds (RENC), Lewiston (MFS), Lincoln (CNC), Mechanic Falls (RENC), Montville (RENC), Mount Desert (PROC), Mount Vernon (RENC), Newport (RENC), Norridgewock (RENC), Pittsfield (RENC), Reed Plantation (CNC), Sebago (CNC), Sidney (RENC), Steuben (UVM), Strong (RENC), Waterville (RENC), Wilton (CNC), Winslow (RENC).

***Elaphropus dolosus* (LeConte) (Plate 29)**

Habitat: Sand banks along medium to large rivers.

Flight dynamics: Fully winged, no flight records.

Biology: Unknown.

General range: Widespread in western plains with a few isolated eastern records. Northeast to central Maine, in southern New Hampshire on Merrimack River, on Connecticut River and Lake Champlain, in Ontario on Prince Edward Island, a peninsula in Lake Ontario, and at Grand Bend on Lake Huron. Apparently a gap

between here and the main range of the species. North to Indiana, Wisconsin, Minnesota, North Dakota, Montana, west to Washington, Oregon, California, south to Arizona, New Mexico, Texas, Arkansas, and Missouri.

Maine locality (1): Fairfield (PVT).

***Elaphropus granarius* (Dejean) (Plate 29)**

Habitat: Open, sparsely vegetated areas, pastures, fields, lawns and also sand pits. Taken in tundra on Mt. Mansfield, Vermont, at 1,200 m elevation  
Flight dynamics: Wing dimorphic, in light trap records.

Biology: In Vermont, has been collected twice at anthills of *Lasius alienus* Förster.

General range: An eastern and central North American species. Northeast to Nova Scotia and New Brunswick, in Québec north to counties north of the Vermont border and in the Montreal area; in the Ottawa Valley of Ontario west to Hull, north to Michigan, Wisconsin, and Minnesota; west to Iowa, Nebraska, and Kansas; south to Arkansas, Mississippi, and Florida.

Maine localities (7): Columbia Falls (CNC), Fort Kent (CNC), Mechanic Falls (RENC), Mount Katahdin Township (PVT), Newfield (CNC), Parsonsfield (CNC, RPWC), Sidney (PVT).

***Elaphropus incurvus* (Say) (Plate 29)**

Habitat: Bare mud, wet or partly dry in many situations, along margins of rivers and lakes, in gardens and wet parts of fields; has been taken in beaver lodges and from under roots of goldenrod.

Flight dynamics: Fully winged, in light trap records.

Biology: Unknown.

General range: A nearly transcontinental species. Northeast to New Brunswick, in Québec north to Lac St. Jean and Abitibi, in Ontario north to Ottawa and Parry Sound, in Manitoba north to Lake Manitoba, in southern Saskatchewan north to Regina, in British Columbia west to Kamloops in the Okanogan Valley, west to Washington, Oregon, south into Idaho, Nebraska, Arkansas, Kentucky, West Virginia, Maryland, and New Jersey.

Maine localities (24): Albany Township (CNC), Anson (CNC), Auburn (CNC), Bar Harbor (PROC), Berwick (CNC), Charleston (RENC), Clinton (PVT), Fairfield (PVT, RENC), Fryeburg (CNC), Lewiston (MFS), Lincoln (CNC), Manchester (RENC), Mechanic Falls (RENC), Montville (RENC), Mount Vernon (RENC), Newfield (CNC), Newport (RENC), Norridgewock (RENC), Sabattus (RENC), Sebago (CNC), Sidney (RENC), Steuben (UVM), T2 R9 WELS (RENS), Wilton (CNC).

***Elaphropus saturatus* (Casey) (Plate 29)**

Habitat: Shores of rivers and lakes on coarse sand, especially upper banks with sparse vegetation.

Flight dynamics: Fully winged, no flight records.

Biology: Teneral adults appear in late August; strictly nocturnal and must be flooded out of banks.

General range: An eastern and central North American species. Northeast to Nova Scotia and New Brunswick, in Québec north to Québec City and the Montreal area, in Ontario north to Ottawa and Bayfield on Lake Huron, northwest to Wisconsin, west to Minnesota, Kansas and Texas, south to Tennessee, Alabama, and Georgia.

Maine localities (17): Anson (CNC, RENC), Bancroft (CNC), Berwick (CNC), Buxton (PVT, RENC), Cornish (RPWC), Embden (RPWC), Fryeburg (CNC), Mercer (RENC), Mexico (CNC), Norridgewock (RENC), Pittsfield (RENC), Sidney (RENC), South Berwick (CNC), Squapan Township (CNC), Strong (RENC), Waterville (RENC), Wilton (CNC).

***Elaphropus tripunctatus* (Say) (Plate 30)**

Habitat: In sterile gravel on riverbanks and exposed lake shores.

Flight dynamics: Fully winged, in light trap records.

Biology: Unknown.

General range: An eastern and central North American species. Northeast to Nova Scotia and New Brunswick, in Québec to the south shore of the Gaspé, north to Québec City, in Ontario north to Ottawa, north to Michigan, Iowa, west to Missouri, Oklahoma, Texas, south to the Gulf Coast and Georgia.

Maine localities (13): Anson (CNC), Buxton (PVT, RENC), Cornish (CNC), Fort Kent (CNC), Garfield Plantation (MFS), Mexico (CNC), Moscow (RENC), Nesourdnhunk Township (CNC), Norridgewock (RENC), Sidney (RENC), Strong (RENC), T10 R7 WELS (MFS), T15 R13 WELS (CNC).

***Elaphropus vernicatus* (Casey) (Plate 30)**

Habitat: Nests of mound-building ants, *Formica exsectoides* Forel.

Flight dynamics: Fully winged, no flight records.

Biology: Unknown.

General range: An eastern and central North American species. Northeast to New Brunswick, in Québec north to Bécancour near Trois Rivières, northwest to southern Manitoba and Saskatchewan, west to Iowa, Missouri, south to Kentucky, and North Carolina.

Maine localities (14): Augusta (UNH), Cutler (CNC), Edmunds Township (CNC), Fryeburg (CNC), Lebanon (CNC), Lewiston (MFS),

Madrid Township (CNC), Mount Vernon (MFS), Naples (CNC), Newfield (CNC), Reed Plantation (CNC), Riley Township (UVM), South Berwick (CNC), Wilton (CNC).

***Elaphropus vivax* (LeConte) (Plate 30)**

Habitat: Shores of rivers, brooks, lakes, under debris on mud or sand.

Flight dynamics: Fully winged, no flight records.

Biology: Nocturnal, caught by flooding banks.

General range: An eastern and central North American species. Northeast to central Maine, in Québec north to Bécancour, in Ontario north to Ottawa, north to Michigan and Wisconsin, west to Iowa, Missouri, Arkansas, Louisiana, south to Alabama and Georgia.

Maine localities (3): Clinton (RENC), Sidney (PVT, RENC), Waterboro (RENC).

***Elaphropus xanthopus* (Dejean) (state record only from Bousquet and Larochelle (1993) and Bousquet (2010, 2012))**

Habitat: Moist ground on clay, silt or sandy mud, near marshes, ponds or lakes, or along rivers, among stranded marsh plants.

Flight dynamics: Fully winged, occasionally attracted to artificial lights at night.

Biology: Adults overwinter and may be found throughout the year; egg-laying season apparently unknown.

General range: In the East, from Nova Scotia through Québec and Ontario west to Michigan, south to Arkansas, southeast from there to Florida and north again.

Maine localities: No specific Maine localities known.

**Genus *Porotachys***

***Porotachys bisulcatus* (Nicolai) (Plate 39)**

Habitat: Sawdust piles, sawmills, construction sites, damp fermenting spruce bark; Washington specimens were taken beneath deeply buried stump in a cow pasture on fine sand of a river floodplain.

Flight dynamics: Fully winged, in light trap records.

Biology: Often swarms at night or sunset, teneral adults appear in autumn.

General range: An adventive Old World species. In the Old World, southern and central Europe and North Africa, Madeira, east to the Caucasus and Armenia. In Massachusetts since before 1900; now also in Northeast to New Brunswick, in Québec north to Chicoutimi, west to Minnesota and North Dakota, south to Ohio, Pennsylvania, Vermont and New Hampshire; isolated in western Washington.

Maine locality (1): Lebanon (UNH).

**Genus *Polyderis***

***Polyderis laeva* (Say) (Plate 39)**

Habitat: Under stones and leaves at borders of marshes or sluggish streams, also recorded from refuse pile by ant nest and under stones and moss clumps on barren rock ledges and amid goldenrod roots.

Flight dynamics: Fully winged, flight records.

Biology: Unknown.

General range: An eastern and central North American species. Northeast to Nova Scotia and New Brunswick, in Québec north to Québec City, in Ontario north to Ottawa and Grand Bend, north to Michigan, northwest to North Dakota, west to Iowa, Missouri, Arkansas, southwest to Texas, south to Gulf of Mexico and Florida.

Maine localities (6): Bar Harbor (CNC), Belgrade (RENC), Lebanon (UNH), Mount Desert (PROC), Pittsfield (RENC), Winslow (RENC).

**Genus *Paratachys***

***Paratachys proximus* (Say) (record from Majka et al. (2011)) (Plate 37)**

Habitat: Wet ground proximal to low-energy aqueous environments (ponds, slow streams, marshes), on fine-grained substrates like clay and mud, at most partly sandy; in open or at most partly shaded environments.

Flight dynamics: Fully winged; often attracted to artificial lights at night, occasionally found in wind-drifted materials.

Biology: Teneral adults tend to emerge in mid-summer; overwinter as adults, which may be found year-round. Egg-laying seasonality unknown.

General range: In the East, from Georgia west to Louisiana and Arkansas, north to Missouri and South Dakota in the west but to Québec, Vermont, and Maine in the Northeast.

Maine localities (1): T9 SD (PVT).

***Paratachys scitulus* (LeConte) (Plate 38)**

Habitat: Muddy sand on banks of rivers, in beaver lodges, also under dead leaves on muddy shores of ponds.

Flight dynamics: Fully winged, multiple flight records.

Biology: Observed taking wing while swimming.

General range: An eastern and central species. Northeast to New Brunswick, in Québec north to Gatinaeu, north Ontario and Michigan, west to South Dakota, Kansas, and Texas, Gulf Coast and Florida.

Maine localities (6): Embden (RPWC), Lewiston (MFS), Mercer (RENC), Norridgewock (RENC), Paris (MCZ), Waterville (RENC).

### Subfamily Patrobinae

#### Tribe Patrobini

#### Genus *Diplous*

##### *Diplous rugicollis* (Randall) (Plate 28)

**Habitat:** Gravel banks along clean, cold streams in hills or mountains. The stream must be wide enough to interrupt the forest canopy, so that direct sunlight can reach the gravel banks for part of the day.

**Flight dynamics:** Fully winged, a straggler from the summit of Mt. Washington, probably flew there.

**Biology:** Teneral adults appear from the end of June to mid-August. Beetles disappear in late summer and do not reappear until late April or early May of the following year.

**General range:** A limited area in northeastern North America. Northeast to Nova Scotia and New Brunswick, in Québec north to the Gaspé, Tadoussac and Montreal, in New York limited to the Adirondack and Catskill Mountains; in nearby areas of northeastern Pennsylvania, south to western Massachusetts, and in valleys of the Green Mountains in Vermont and the White Mountains in New Hampshire.

**Maine localities (9):** Batchelders Grant Township (RENC, UVM), Byron (CNC), Hallowell (PVT), Madrid Township (CNC), Mount Katahdin Township (RENC), Nesourdnahunk Township (CNC), New Portland (RENC), Newry (RENC, UVM), Strong (RENC).

#### Genus *Patrobus*

##### *Patrobus foveocollis* (Eschscholtz) (records from Bousquet and Laroche (1993) and Bousquet (2010))

**Habitat:** Coniferous forests in leaf litter, in tundra under bushes; on moist soils rich in plant debris, from marshes to meadows to brush thickets and forests, probably at higher elevations in Maine.

**Flight dynamics:** Mostly short-winged and incapable of flight, but fully winged specimens are known; fully winged form not recorded from North America.

**Biology:** Teneral adults appear in late July to mid-September.

**General range:** A northern transcontinental species extending to eastern Siberia (Kamchatka Peninsula and Kuril Islands). In North America, Northeast to Labrador and Newfoundland, in Québec north to Ungava Bay, in Manitoba north to Hudson Bay, northwest to Alaska, including lower Yukon River and inner Aleutian Islands; west to Creston, British Columbia, isolated in the mountains of Colorado, south to Cypress Hills, southern Alberta, northern Michigan, in

Québec south to Laurentide Park, near Québec City, isolated in mountains of Gaspé, and in the high mountains of northern New York, Vermont, and New Hampshire.

**Maine locality (1):** State record only (PVT).

##### *Patrobus longicornis* (Say) (Plate 38)

**Habitat:** Near streams, ponds, or lakes, but beneath debris on shaded margins (*e.g.*, beneath shrub canopy) and not on exposed shores; bottomland woods

**Flight dynamics:** Wings dimorphic, fully winged form has been taken at light traps.

**Biology:** Teneral adults appear from late June into July, overwinters both as larvae and adults.

**General range:** A nearly transcontinental species not reaching West Coast. Northeast to Newfoundland, in Québec north to Lac St. Jean and James Bay, in Ontario north to Ogoki, to Ft. Smith in the Northwest Territories, west to Lake Okanogan, British Columbia, south into Washington and Oregon, not known from California or Nevada, but found in Arizona, New Mexico, Oklahoma, Louisiana, and Florida.

**Maine localities (42):** Abbot (RENC), Adamstown Township (CNC), Alfred (RENC, RPWC), Andover (CNC), Belgrade (RENC), Berwick (UNH), Brooksville (MCZ), Caratunk (RENC), Carrabassett Valley (PVT, RENC), Chain of Ponds Township (CNC), Cornish (CNC), Eustis (CNC), Fairfield (PVT, RENC), Farmington (PVT), Garfield Plantation (MFS), Hartland (RENC), Isle Au Haut (MCZ), Jackman (CNC), Kibby Township (MFS), Kingsbury Plantation (RENC), Lebanon (CNC), Lewiston (MFS), Lincoln Plantation (CNC), Millinocket (MFS), Mount Vernon (MFS, RENC), Naples (CNC), Nesourdnahunk Township (CNC), Reed Plantation (CNC), Sidney (PVT, RENC), Southwest Harbor (PROC), Squapan Township (CNC), T11 R10 WELS (MFS), T14 R15 WELS (CNC), T15 R13 WELS (CNC), T2 R4 WELS (CNC), T3 R10 WELS (CNC), T4 R10 WELS (CNC), T5 R9 WELS (CNC), Waterville (RENC), Weld (CNC), West Forks Plantation (CNC), Wilton (CNC).

##### *Patrobus septentrionis* Dejean (Plate 38)

**Habitat:** Borders of lakes, ponds, and slow streams, amid grasses and sedges.

**Flight dynamics:** Fully winged, flight observations in Europe.

**Biology:** Teneral appear in late June and July.

**General range:** A circumpolar species. In the Old World, in northern British Isles, northern Scandinavia and Russia, also in the Alps and Ural Mountains, northern Siberia to Pacific

Ocean. In North America, from New Brunswick, Newfoundland and Labrador, Québec and the Northwest Territories north to the Arctic Ocean, throughout Alaska including the Aleutian Islands, south to Washington, Alberta, Saskatchewan, Manitoba and Michigan, isolated in the mountains of Colorado, in Québec south to Abitibi, isolated in boreal plateaus in northern New Hampshire and Maine.

Maine localities (2): Greenville (MFS), T13 R12 WELS (MFS).

***Patrobus stygius* Chaudoir (Plate 38)**

Habitat: Borders of lakes, ponds, slow moving rivers, and fens amid sedges and mosses.

Flight dynamics: Fully winged, light trap records.

Biology: Hibernation as adult and larva, teneral adults appear in early and late summer.

General range: A northern transcontinental species. Northeast to Newfoundland and Labrador, in Québec north to Schefferville and Povungnituk, in the Northwest Territories north to Yellowknife, in Alaska north to Circle, west to Kotzebue and the tip of Alaska Peninsula, south to Anchorage, in the mountains of British Columbia; east of the Rockies, south to northern Michigan, in Québec south to Abitibi, Lac St. Jean and Anticosti Island, south to northern Maine.

Maine localities (4): Chesuncook Township (UNH), Eustis (UNH), Cross Lake Township (MFS), T4 R10 WELS (CNC).

**Genus *Platypatrobus***

***Platypatrobus lacustris* Darlington (Plate 39)**

Habitat: Beaver lodges.

Flight dynamics: Fully winged, light trap records.

Biology: Teneral adults emerge in July, at which time they fly from one beaver lodge to another; eggs are laid from late July to October, adults mate many times (in captivity). Adults die in fall and third instars overwinter. On cloudy or rainy days in late July or early August, adults can be found in superficial coverage on beaver house, otherwise they are deep within the lodge.

General range: A northern species. Northeast to New Brunswick, in Québec north to Mt. Tremblant, in Ontario from Batchawana Bay on Lake Superior, in Northwest Territories on an island in Great Slave Lake, in Manitoba and Saskatchewan, also in Ohio, New Hampshire and Vermont. Knowledge of distribution is incomplete due to collecting difficulties.

Maine localities (6): Carrabassett Valley (UVM), Enfield (MFS), Lower Cupsuptic Township (MFS), T17 R4 WELS (MCZ), T6 R11 WELS (MFS), T9 R5 WELS (MFS).

**Subfamily Psydrinae**

**Tribe Psydrini**

**Genus *Nomius***

***Nomius pygmaeus* (Dejean) (Plate 36)**

Habitat: Forest species found beneath bark.

Flight dynamics: Fully winged, in light trap records.

Biology: This beetle emits a pungent odor of rotting cheese. Great numbers will fly to lights after a rainstorm.

General range: A circumpolar species. In the Old World, found only south of the Alps in Europe, from Spain to Bulgaria, Caucasus, Armenia, and Morocco. In the New World, Northeast to Maine, in Québec north to Lac Mistassini and Abitibi, in Ontario north to Sudbury and Kenora, north to Winnipeg, Manitoba, in British Columbia west to the Queen Charlotte Islands, south through the mountains to California, south to Arizona, absent from the Great Plains, south to Arkansas, Oklahoma, Tennessee, and Georgia.

Maine locality (1): Allagash (UNH).

**Subfamily Brachininae**

**Tribe Brachinini**

**Genus *Brachinus***

***Brachinus cordicollis* Dejean (Plate 19)**

Habitat: Muddy-sandy margins of medium- to large-sized rivers, and large lakes. Often under rocks.

Flight dynamics: Fully winged, in light trap records.

Biology: Gravid females appear in mid-June and in late August. Like other members of the genus, defends itself with an explosive charge of steam and quinones. Active at night and easily found at that time.

General range: An east-central species. Northeast to New Brunswick, in Québec along the St. Lawrence River to Ile d'Orleans, on the Richelieu River to Lake Champlain, west on the Ottawa River to Ft. Coulonge, in Ontario along the North Shore, and a single record from Lake Abitibi, on the Great Lake shores of Michigan and north to northern Minnesota, west to South Dakota, Nebraska, Utah and New Mexico, south to Kansas, Arkansas, Kentucky, West Virginia, and Virginia.

Maine localities (3): Mount Vernon (RENC), New Sharon (PVT), Sidney (PVT).

***Brachinus cyanipennis* Say (Plate 19)**

Habitat: Margins of lakes, ponds and rivers, including small ones. Found beneath cover such as driftwood and loose bark on stumps or logs, stones and heaps of gravel, common in beaver lodges.

**Flight dynamics:** Fully winged, flight observations.

**Biology:** Gravid females appear in August, teneral adults emerge both in early June and mid-September; host unknown.

**General range:** An eastern species. Northeast to New Brunswick, in Québec along the St. Lawrence River to Bécancour, in Ontario north to Manitoulin Island, in Michigan north to the Straits of Mackinac, north to the southeastern corner of Manitoba, west to North Dakota, South Dakota, Nebraska, Oklahoma, and New Mexico, south to the Gulf of Mexico, as far east as Mobile, Alabama but absent from the southeastern coastal states from Florida to North Carolina.

**Maine localities (21):** Anson (CNC), Bancroft (CNC), Dixfield (RENC), Embden (RPWC), Fryeburg (RPWC), Gardiner (UNH), Hartland (RENC), Lebanon (UNH), Lee (RPWC), Litchfield (CNC), Mercer (RENC), Mount Vernon (MFS, RENC, RPWC), Newfield (RPWC), Norridgewock (RENC), Orono (MFS), Orrington (RENC), Pittsfield (RENC), Princeton (UNH), Searsport (MFS), Southwest Harbor (PROC), Waterville (RENC).

***Brachinus cyanochroaticus* Erwin (Plate 19)**

**Habitat:** On the margins of lakes, small rivers and especially small ponds, has been taken in a beaver lodge and on beaver dams.

**Flight dynamics:** Fully winged, no flight records.

**Biology:** Teneral adults known from April; host unknown. Has been collected at night on a beaver dam.

**General range:** An east-central species. East to New Brunswick, in Québec on the St. Lawrence east only to Joliette, in Ontario north to Lake of the Woods, in the southern prairie provinces west to Shuswap Lake in southeastern British Columbia, south to Idaho, Colorado, Kansas, Missouri, Indiana, Ohio, Pennsylvania, and New Jersey.

**Maine localities (2):** Berwick (CNC), Litchfield (CNC).

***Brachinus fumans* (F.) (Plate 19)**

**Habitat:** Near various bodies of water; in Vermont, limited to shores of lakes and large rivers.

**Flight dynamics:** Fully winged, in light trap records.

**Biology:** Gravid females appear in August, teneral adults emerge from mid-August to mid-September.

**General range:** A transcontinental species. Northeast to New Brunswick, in Québec north of the Ile d'Orleans and Hull, north in Manitoba to the extreme southwestern corner, in Alberta north to Lethbridge, northwest to Creston, British Columbia in the extreme southeastern

part of the province, west to eastern Washington and Oregon, southwest to San Diego, California, in Mexico south to Sinaloa, Torreón, and Ciudad Mante, south to the Gulf Coast in the eastern USA as far south as Orlando, Florida.

**Maine localities (2):** Mount Vernon (MFS), Vassalboro (PVT).

***Brachinus janthinipennis* Dejean (Plate 19)**

**Habitat:** Under driftwood and stones on margins of lakes and rivers.

**Flight dynamics:** Wings vestigial.

**Biology:** Larva is a parasitoid in the pupa of various species of *Dineutus* MacLeay (Gyrinidae). Other species of *Brachinus* Weber are believed to have a similar life history.

**General range:** An eastern species. Northeast to Maine, in Québec down the St. Lawrence to Bécancour, west to Ft. Coulonge on the Ottawa River, in Ontario north to the Bruce Peninsula, in Michigan north to Lake Superior, north to Minnesota, northwest to North Dakota, west to eastern Colorado, in Texas south to Blanco Co. near Austin, but not in eastern Texas, south to Oklahoma, Missouri, southern Indiana, Pittsburgh, Pennsylvania, and Fairfax, Virginia.

**Maine localities (6):** Anson (CNC), Hiram (CNC), Lewiston (MFS), New Sharon (RENC), Sidney (RENC), Waterville (RENC).

***Brachinus medius* Harris (Plate 19)**

**Habitat:** Found around all bodies of water.

**Flight dynamics:** Fully winged, light trap records.

**Biology:** Gregarious.

**General range:** A transcontinental species. Northeast to Maine, in Québec down the St. Lawrence River to Bécancour and west to Ft. Coulonge, north to northern Minnesota, North Dakota, Montana, Idaho, northwest to southern British Columbia, west to Washington, Oregon, northern California, south to Utah, Colorado, Texas, the Gulf of Mexico and Florida, also extends into Mexico. Not recorded from Virginia or the Carolinas.

**Maine localities (4):** Durham (RPWC), Lebanon (UNH), Mount Vernon (MFS, RPWC), Newfield (RPWC).

***Brachinus ovipennis* LeConte (Plate 20)**

**Habitat:** Shores of large lakes and rivers.

**Flight dynamics:** Fully winged, in light trap records.

**Biology:** Unknown.

**General range:** An eastern and central North American species. Northeast to Maine, in Québec down the St. Lawrence River to Bécancour, in Ontario from the shores of Lake Ontario and Lake Erie, in Michigan only from the southern third of the lower peninsula north to Port Huron,

and Grand Rapids, in Minnesota north to Minneapolis, west to southern South Dakota, western edge of Kansas, southwest to Oklahoma, south to Dallas, Texas, Missouri, Indiana, Ohio, Pennsylvania, New Jersey, and Massachusetts.

Maine localities (7): Belgrade (RENC), Milbridge (MFS), New Sharon (RENC), Pittsfield (RENC), Sidney (RENC), Waterville (RENC), Winslow (RENC).

***Brachinus patruelis* LeConte (Plate 20)**

Habitat: Margins of vernal ponds in oak forest with mountain laurel; adults in moist leaves.

Flight dynamics: Vestigially winged.

Biology: Unknown.

General range: Largely an Atlantic coastal species.

From Maine to Cape May, New Jersey; also a single record from Detroit, Michigan and a possible one from northeastern Illinois.

Maine locality (1): Waterville (PVT).

***Brachinus vulcanoides* Erwin (Plate 20)**

Habitat: Most specimens caught on sea beaches but some are found on borders of fresh water, usually near the coast. In Rhode Island, adults common in sedge hummocks and moist leaves on margins of vernal ponds in red maple swamps.

Flight dynamics: Fully winged and likely capable of flight.

Biology: Probably overwinters in the adult phase, since they can be found late in autumn and early in the spring; egg-laying seasonality unknown.

General range: An Atlantic coastal species. From Maine to New Jersey and an anomalous record from Crescent City, Florida.

Maine locality (1): Waterville (RENC).

**Subfamily Harpalinae**

**Supertribe Pterostichitae**

**Tribe Pterostichini**

**Genus *Poecilus***

***Poecilus chalcites* (Say) (Plate 39)**

Habitat: Grasslands, open fields, forest edges, around damp soil, large numbers exposed by plowing; common in the Midwest, rare in the East.

Flight dynamics: Fully winged, common at light traps.

Biology: Gravid females appear in early May, teneral adults emerge in the late summer and fall; hibernates as an adult.

General range: An eastern and central North American species. Northeastern limit in New Brunswick, in Québec on Anticosti Island, north to Québec City, in Ontario north to Lake of the Woods, northwest to North Dakota, west to South Dakota, Kansas, Colorado, south to Louisiana, the Gulf Coast, and Florida.

Maine locality (1): Eliot (RPWC).

***Poecilus lucublandus lucublandus* (Say) (Plate 39)**

Habitat: Forest edges, open fields, disturbed sites, gardens, pastures, sand and gravel pits, river and lake shores; has also been taken in mountain tundra and beaver lodges.

Flight dynamics: Fully winged, but light trap records are rare.

Biology: Mating occurs in late May, gravid females appear from May to July. Teneral adults emerge from August into October; hibernates as an adult. Females can emit a defensive secretion which paralyzes males.

General range: A transcontinental species. Northeast to Nova Scotia and New Brunswick, in Québec north to Anticosti Island, Lac St. Jean and Abitibi, in Ontario north to Sioux Lookout, in Manitoba north to Lake Winnipegosis, in Alberta north to Ft. McMurray, in the Northwest Territories north to Ft. Smith, in British Columbia west to Vancouver Island, in Washington and Oregon only east of the Cascade Mountains, south to Utah, Colorado, New Mexico, Oklahoma, Missouri, Tennessee, Georgia, and South Carolina. Two other subspecies, *Poecilus lucublandus acomanus* Casey and *Poecilus lucublandus louisianus* Casey, are known from New Mexico and Missouri, respectively.

Maine localities (62): Abbot (RENC), Albany Township (CNC), Albion (RENC), Alfred (RPWC), Anson (CNC), Athens (RENC), Auburn (CNC), Augusta (UNH), Bar Harbor (PROC), Belgrade (RENC), Berwick (CNC), Blue Hill (RENC), Buckfield (RENC), Camden (CNC), Caratunk (RENC), Carrabassett Valley (CNC, PVT, RENC), China (RENC), Clinton (RENC), Columbia Falls (RENC), Cumberland (RENC), East Millinocket (CNC), Fairfield (PVT, RENC), Fryeburg (PVT, RPWC), Garland (RENC), Hancock (CNC), Harrington (UVM), Hartland (RENC), Lewiston (MFS), Magalloway Plantation (RPWC), Mayfield Township (RENC), Mechanic Falls (RENC), Milbridge (RENC), Millinocket (CNC), Montville (RENC), Moscow (RENC), Mount Vernon (MFS), Naples (CNC), Northport (RPWC), Oakland (RENC), Orono (MFS), Palmyra (RENC), Parsonsfield (CNC), Phippsburg (RENC), Pownal (PVT), Presque Isle (MFS), Reed Plantation (CNC), Sabattus (RENC), Saint Francis (CNC), Sidney (RENC), Skowhegan (RENC), Southwest Harbor (PROC), Steuben (MFS, RENC, UVM), T3 R8 WELS (MFS), T8 R5 WELS (CNC), Washburn (RENC), Washington (RENC), Waterville (RENC), West Forks Plantation (CNC), Whitneyville (MFS), Wilton (CNC), Windsor (RENC), Winslow (RENC).

**Genus *Gastrellarius******Gastrellarius honestus* (Say) (Plate 31)**

**Habitat:** Forests, both hardwood and evergreen, up to the treeline in New England, but absent from seasonally flooded forests; found under bark or in fallen logs.

**Flight dynamics:** Vestigially winged.

**Biology:** A spring breeder, female overwinters in gravid condition; teneral adults also emerge in spring to early summer.

**General range:** A northeast and north-central North American species with a southeastern extension along the Appalachians. Northeast to Nova Scotia and New Brunswick, in Québec north to south shore of Gaspé and to St. Fidele (eastern Charlevoix Co.), to Labelle near Mt. Tremblant, west to Michigan, eastern Illinois, south to Kentucky, Virginia, south in the Appalachian Mountains to Alabama and Georgia.

**Maine localities (27):** Acton (RPWC), Anson (RENC), Bar Harbor (PROC), Caratunk (RENC), Chain of Ponds Township (CNC), Chesterville (MFS), China (RENC), Eustis (CNC), Fairfield (RENC), Gouldsboro (PROC), Grafton Township (CNC), Kibby Township (MFS), Magalloway Plantation (MFS), Moscow (RENC), Mount Desert (PROC), Mount Katahdin Township (RENC), Mount Vernon (MFS), Nesourdnahunk Township (CNC), Newry (UVM), Orrington (MFS), Oxbow Plantation (MFS), Sidney (RENC), Skowhegan (RENC), T3 R10 WELS (RENC), T3 R8 WELS (RENC), Trout Brook Township (RENC), Waterville (RENC).

**Genus *Stereocerus******Stereocerus haematopus* (Dejean) (Plate 45)**

**Habitat:** In drier, well-drained tundra habitats, in moss and under stones.

**Flight dynamics:** Wings dimorphic, no flight records.

**Biology:** Overwinters as adult or larva, gravid females appear in July, teneral adults in late July.

**General range:** A circumpolar species. In the Old World, in far northern European Russia and Siberia. In the New World, Northeast to Newfoundland (northern Peninsula) and Labrador, in Québec north to Ungava Bay, in Nunavut and the Northwest Territories north to the Arctic Ocean and Banks Island, throughout Alaska except for southeastern panhandle, south to British Columbia, south to Edmonton, Alberta and Gillam on the Nelson River in Manitoba; south to the coastal tundra of Hudson Bay; isolated mountains populations occur in Montana, Wyoming, New York, Vermont, New Hampshire and Maine, and on the Gaspé Peninsula of Québec.

**Maine locality (1):** Mt. Katahdin Township (CNC, MFS).

**Genus *Myas******Myas coracinus* Say (Plate 35)**

**Habitat:** Leaf litter in deciduous forests.

**Flight dynamics:** Vestigially winged.

**Biology:** Unknown.

**General range:** An eastern species. Northeast to Maine, north to Massachusetts, New York, Point Pelee, Ontario, west to Michigan, Wisconsin, and Illinois, south to Tennessee, Alabama, and Georgia.

**Maine locality (1):** Bar Harbor (PROC).

***Myas cyanescens* Dejean (Plate 35)**

**Habitat:** In mesic and mature hardwood or mixed forest, sometimes on drier secondary forest sites, usually with oaks, often on rock ledges or at the forest margin, under cover such as leaf litter or fallen logs.

**Flight dynamics:** Vestigially winged; incapable of flight.

**Biology:** Teneral adults found in mid-August; breeds in fall, and both adults and larvae overwinter.

**General range:** An eastern and central North American species. Northeast to New Brunswick and Nova Scotia, in Québec north to Lac St. Jean and Lake Timiskaming, in Ontario north to Ottawa, Delhi, and Chatham, northwest to Minnesota, south to Illinois, Ohio, south in the mountains to Alabama and Georgia.

**Maine localities (11):** Anson (RENC), Bethel (CNC), Harrington (UVM), Islesboro (PVT), Monmouth (MFS), Mount Desert (PROC), Orrington (MFS), Sidney (RENC), Steuben (UVM), Waterboro (RENC), Waterville (RENC).

**Genus *Pterostichus******Pterostichus adoxus* (Say) (Plate 39)**

**Habitat:** Under bark of fallen trees in hardwood forests, particularly those with sugar maples and American beech.

**Flight dynamics:** Vestigially winged.

**Biology:** Gravid females appear in July, larvae appear in fall and overwinter; teneral adults emerge from early May to mid-August.

**General range:** A northeastern and north-central North American species with an extension south along the Appalachian Mountains. Northeast to Nova Scotia and New Brunswick, in Québec north to Québec City and Hull, in Ontario north to Ottawa, west to Michigan and Wisconsin, south to Indiana and Ohio, Virginia and New Jersey, in the Appalachians south to Georgia, the Carolinas, and Tennessee.

Maine localities (28): Anson (RENC), Bar Harbor (PROC, UVM), Cape Elizabeth (RENC), Caratunk (RENC), Carrabassett Valley (RENC), Chain of Ponds Township (CNC), Eustis (CNC), Fairfield (RENC), Fryeburg (RPWC), Grafton Township (CNC), Islesboro (PVT), Jim Pond Township (RENC), Kibby Township (MFS), Moscow (RENC), Mount Desert (MFS), Mt. Katahdin Township (RENC), Norridgewock (RENC), Parsonsfield (RPWC), Pittston Academy Grant (RPWC), Sidney (RENC), T1 R9 WELS (RENC), T3 R10 WELS (RENC), T3 R8 WELS (MFS, RENC), T5 R18 WELS (RPWC), T9 R7 WELS (MFS), Unity (RENC), Waterville (RENC), York (PVT, RENC).

***Pterostichus adstrictus* Eschscholtz (Plate 40)**

Habitat: A forest species, in rotten logs and fallen leaves, numbers increase in clear-cut areas; generally more common in stands dominated by conifers than hardwoods, in which *Pterostichus pennsylvanicus* LeConte often predominates.

Flight dynamics: Fully winged, flight observed in Europe.

Biology: Teneral adults appear in late summer, with hibernation in the adult stage. Gravid females occur from spring into mid-summer.

General range: A circumpolar species. In the Old World, in northern coniferous regions in northern Scandinavia, Iceland, Faeroes, Scotland, northern England and Wales, across northern Russia and Siberia to Pacific Ocean. In the New World, Northeast to Newfoundland and Labrador, in Québec north to Ungava Bay, in Ontario and Manitoba north to Hudson Bay, in the Northwest Territories north to Aklavik, in Alaska west to Circle and Ft. Yukon but not in the Brooks Range or North Coast, west along the Aleutian Islands. In the western mountains south to California, Arizona and New Mexico, in the Great Plains south to Nebraska, Minnesota, south to northern Indiana, Pennsylvania, northern New York, south in the mountains to Virginia.

Maine localities (60): Augusta (UVM), Bar Harbor (PROC), Big Six Township (MFS), Brunswick (MFS), Byron (CNC), Canaan (RENC), Chain of Ponds Township (CNC), Deer Isle (RENC), Edmunds Township (CNC), Fairfield (RENC), Gouldsboro (PROC), Grand Isle (CNC), Hancock (CNC), Kibby Township (MFS), Kineo Township (MFS), Lubec (RENC), Madrid Township (CNC), Masardis (MFS), Matinicus Isle Plantation (MFS), Milbridge (RENC), Moro Plantation (CNC), Moscow (RENC), Mount Desert (PROC, UVM), Mount Katahdin Township (RENC), Nashville Plantation (MFS), Nesourdnhunk Township (CNC), Norridgewock (RENC),

Orono (MFS), Orrington (MFS), Oxbow Plantation (MFS), Phippsburg (RENC), Portage Lake (MFS), Rangeley (PVT), Reed Plantation (CNC), Saint Croix Township (MFS), Southwest Harbor (PROC), Stockholm (MFS), T10 R3 WELS (MFS), T10 R8 WELS (MFS), T11 R10 WELS (MFS), T11 R7 WELS (MFS), T12 R7 WELS (MFS), T14 R15 WELS (CNC), T14 R6 WELS (MFS), T15 R13 WELS (CNC), T15 R8 WELS (MFS), T16 R4 WELS (MFS), T2 R4 WELS (CNC), T4 R10 WELS (CNC), T5 R18 WELS (RPWC), T6 R11 WELS (UVM), T8 R5 WELS (MFS), T8 R8 WELS (MFS), T9 R5 WELS (MFS), T9 R7 WELS (MFS), Unity (RENC), Upton (CNC), Waterville (RENC), West Forks Plantation (CNC), Winterville Plantation (MFS).

***Pterostichus arcticola* (Chaudoir) (Plate 40)**

Habitat: In Maine, on alpine tundra under mosses and rocks, often on glacial till.

Flight dynamics: Vestigially winged.

Biology: On Mt. Washington, gravid females observed in June-July, teneral adults emerged from June to September.

General range: A northern transcontinental species. North to the Arctic Ocean and Baffin and Victoria Islands in Nunavut, in Yukon at Dawson, in Northwest Territories at Ft. Norman, south to Mt. McKinley, Alaska; in Québec south to James Bay and to Battle Harbor, Labrador. Relict populations in high mountains of the Gaspé Peninsula of Québec, Maine, New Hampshire, and New York.

Maine locality (1): Mount Katahdin Township (CNC).

***Pterostichus brevicornis* (Kirby) (Plate 40)**

Habitat: In North America, in northern or higher altitude coniferous forests as well as in the open tundra, but in the Old World this is strictly a tundra species.

Flight dynamics: Vestigially winged.

Biology: Numerous in pitfall traps and in large aggregations in loose bark on dead stumps or rotten logs, under dead leaves, in the tundra under bushes. Teneral adults appear in July to September, can hibernate as adult, larva or pupa; gravid females appear from June to July on Mt. Washington, New Hampshire, and third instars may be found there from May into July. Apparently a two-year life cycle.

General range: A circumpolar Holarctic species.

In the Old World, on the Kola Peninsula of northern Russia, northern Ural Mountains, northeastern Siberia. In the New World, on the northern peninsula of Newfoundland, in Québec north to Ungava Bay, in Ontario north

to Hudson Bay, in the Yukon north to Arctic Coast, throughout Alaska including Pribilofs, St. Matthew and St. Lawrence Island, south to Skagway, northern British Columbia, to Thompson, Manitoba; in Ontario, south to the northern shore of Lake Superior, in Québec south to 48<sup>th</sup> parallel including Gaspé and Tadoussac, relict populations in the high elevations of the Adirondacks, Vermont, New Hampshire, and Maine.

Maine localities (3): Grafton Township (CNC), Mount Katahdin Township (MFS), Riley Township (UVM).

***Pterostichus caudicalis* Say (Plate 40)**

Habitat: Among sedges and grasses or bare mud near slow parts of rivers, ponds and especially beaver ponds and shaded wooded shores.

Flight dynamics: Fully winged, no flight records.

Biology: Hibernates in the adult stage; gravid females appear around mid-May.

General range: A transcontinental species. Northeast to Newfoundland, in Québec north to Lac St. Jean and Abitibi, in Ontario north to Hudson Bay, in the Northwest Territories at Ft. Smith, west to Vancouver Island, south to Washington, Oregon, Utah, Colorado, Kansas, Missouri, Illinois, Ohio, West Virginia, and North Carolina.

Maine localities (7): Auburn (RENC), Fryeburg (RPWC), Lewiston (MFS), Norridgewock (RENC), Sanford (CNC), Skowhegan (RENC), Strong (RENC).

***Pterostichus commutabilis* (Motschulsky) (Plate 40)**

Habitat: Near ponds and marshes on sandy, humus-rich soil.

Flight dynamics: Fully winged, drift records indicating flight.

Biology: General adults appear from April into July and late August to October.

General range: A transcontinental species. Northeast to Nova Scotia and New Brunswick, in Québec north to Lac St. Jean and Abitibi, in Ontario north to Parry Sound, in Manitoba north to Riding Mountain, in Saskatchewan north to Saskatoon, in British Columbia, at Salmon Arm, in eastern Washington and Oregon, south to Colorado, Texas, Louisiana, and Florida.

Maine localities: Auburn (RENC), Bar Harbor (PROC), Belgrade (RENC), Clinton (RENC), Cutler (CNC), Fryeburg (RPWC), Garland (RENC), Hartland (RENC), Hiram (CNC), Lebanon (CNC), Lewiston (MFS), Lyman (CNC), Mount Desert (PROC), Mount Vernon (MFS, RENC), Naples (CNC), Newfield (CNC), Phippsburg (RENC), Topsham (RENC), Waterville (RENC).

***Pterostichus coracinus* (Newman) (Plate 40)**

Habitat: In deciduous forests beneath superficial cover, reaches treeline in New England.

Flight dynamics: Vestigially winged.

Biology: Gravid females appear from late April through late July, teneral adults emerge from late June into early September. Hibernation takes place both in adult and larval stages.

General range: An eastern species. Northeast to Newfoundland and Labrador, in Québec north to James Bay and Mistassini, in Ontario to Moose Factory, west to Michigan, Wisconsin, and Illinois, south to Tennessee, Georgia, and South Carolina.

Maine localities (72): Acton (RPWC), Anson (RENC), Appleton (RPWC), Augusta (MFS), Bar Harbor (PROC, UVM), Batchelders Grant Township (RENC), Belgrade (RENC), Brunswick (MFS), Caratunk (RENC), Carrabassett Valley (PVT, CNC), Chain of Ponds Township (CNC), Deer Isle (RENC), Eustis (CNC), Fairfield (PVT, RENC), Fryeburg (RPWC), Garland (RENC), Georgetown (MFS), Gouldsboro (PROC), Grafton Township (CNC), Islesboro (PVT), Jackman (CNC), Kibby Township (MFS), Lebanon (UNH), Magalloway Plantation (RPWC), Masardis (MFS), Milbridge (RENC), Moro Plantation (CNC), Mount Desert (PROC), Mount Katahdin Township (PVT, RENC), Mount Vernon (MFS), Nesourdnahunk Township (CNC), Orono (MFS), Oxbow Plantation (MFS), Phippsburg (RENC), Pittsfield (RENC), Portage Lake (MFS), Presque Isle (MFS), Reed Plantation (CNC), Saint Francis (MFS), Steuben (RENC), T10 R13 WELS (MFS), T10 R3 WELS (MFS), T10 R8 WELS (MFS), T11 R10 WELS (MFS), T11 R7 WELS (MFS), T11 R8 WELS (MFS), T12 R7 WELS (MFS), T14 R6 WELS (MFS), T14 R7 WELS (MFS), T15 R13 WELS (CNC), T15 R6 WELS (MFS), T15 R8 WELS (MFS), T16 R4 WELS (MFS), T17 R4 WELS (MFS), T2 R4 WELS (CNC), T4 R10 WELS (CNC), T6 R11 WELS (UVM), T8 R5 WELS (MFS), T8 R8 WELS (MFS), T9 R5 WELS (MFS), T9 R7 WELS (MFS), T9 R8 WELS (MFS), T9 SD (MFS), Upton (CNC), Warren (MFS), Washburn (RENC), Waterville (RENC), Wayne (MFS), West Forks Plantation (CNC), Winn (MFS), Winterville Plantation (MFS), York (PVT).

***Pterostichus corruscus* LeConte (Plate 40)**

Habitat: Edges of eutrophic ponds, on wet soil with dense vegetation, often near mouse burrows deep in the grass litter. In New Brunswick, usually found shortly after snow melt.

Flight dynamics: The few specimens studied have vestigial wings, but it may be dimorphic.

Biology: Unknown.

General range: A northeastern species. Northeast to New Brunswick, in Québec north to Lake Ramsey (Gatineau), in Ontario north to Ottawa and Muskoka Lakes, west to Rochester, New York, south to New Jersey, Long Island, and Connecticut.

Maine localities (2): Canaan (RENC), Wayne (CNC).

***Pterostichus corvinus* (Dejean) (Plate 40)**

Habitat: Marshy borders of ponds, lakes, rivers, especially common on sedge-covered mud flats bordering shallow ponds, fairly common in beaver lodges.

Flight dynamics: Fully winged, taken in flight on sunny day over a fen.

Biology: Gravid females appear in late May to mid-June, mating takes place in June, general adults appear in July to October. Hibernation in the adult stage.

General range: A transcontinental species in Canada but limited to an east-central distribution in the USA. Northeast to New Brunswick, in Québec north to the Saguenay and Abitibi, in Ontario north to Lake Simcoe and Gravenhurst, in Manitoba north to Lake Winnipeg, in British Columbia north to Liard River Hot Springs, west to Oliver and Penticton, in eastern Washington, as well as south to Colorado, Nebraska, Minnesota, Illinois, Ohio, West Virginia, and the mountains into Georgia.

Maine localities (25): Acton (CNC), Athens (RENC), Auburn (CNC), Bar Harbor (CNC, PROC), Belgrade (RENC), Benton (RENC), Brighton Plantation (RENC), China (RENC), Corinna (RENC), Fairfield (RENC), Lewiston (MFS), Litchfield (CNC), Milo (CNC), Monmouth (CNC), Mount Desert (PROC, UVM), Mount Vernon (MFS, RENC), Newfield (RPWC), Newport (RENC), Orono (MFS), Orono (MFS), Princeton (UNH), Sidney (PVT), Waterville 9RENC), Wayne (CNC), Whitefield (RENC), Wilton (CNC).

***Pterostichus diligendus* Chaudoir (Plate 40)**

Habitat: Deciduous forest under logs or stones, especially in humid areas near streams or alder swamps.

Flight dynamics: Vestigially winged.

Biology: Breeds in fall, female broods the eggs, under moss of logs and stones; the species overwinters as both larvae and mature adults.

General range: An eastern species. Northeast to central Maine, in Québec at Knowlton and Lake Memphremagog, in New York north to the Adirondack Mountains and Rochester, north

to Ohio, west to Illinois, south to Kentucky and North Carolina.

Maine localities (6): Buckfield (RENC), Monmouth (CNC), Mount Vernon (RENC), New Portland (RENC), Penobscot (CNC), Sidney (RENC).

***Pterostichus lachrymosus* (Newman) (Plate 41)**

Habitat: In thin, second-growth forest at base of rock ledges, under stones. Abundant in hemlock-mixed forest with understory vegetation on sandy soil.

Flight dynamics: Vestigially winged.

Biology: Unknown.

General range: An Appalachian species. Northeast to New Brunswick, in Québec north to Québec City and Montreal, in Ontario to Ottawa and Prince Edward County, west to eastern Ohio, south to the mountains of Tennessee and Georgia.

Maine localities (12): Bar Harbor (CNC), Batchelders Grant Township (RENC), Bradley (RPWC), Caratunk (CNC), Fairfield (RENC), Garland (RENC), Lee (RPWC), Mars Hill (MFS), Mount Desert (PROC), Orono (MFS), Raymond (UVM), Reed Plantation (CNC).

***Pterostichus luctuosus* (Dejean) (Plate 41)**

Habitat: Marshes, marshy shores of lakes, slow rivers, and streams.

Flight dynamics: Fully winged, in light trap records.

Biology: General adults have been observed from early May to late September, and hibernation occurs in the adult stage. A typical spring breeder, gravid females may be found from late May to mid-June.

General range: A nearly transcontinental species in southern Canada and northern USA. Northeast to southwestern Newfoundland, in Québec north to Anticosti, Lac St. Jean and Lac Mistassini, in Ontario north to Nipigon, in Alberta north to Ft. McMurray, in British Columbia west to Vancouver Island, south to eastern Washington, Idaho, Nebraska, Iowa, Illinois, Ohio, West Virginia, Virginia, and Maryland.

Maine localities (47): Acton (CNC), Albany Township (RENC), Alfred (RENC), Appleton (CNC), Athens (RENC), Bar Harbor (UVM), Baring Plantation (CNC), Batchelders Grant Township (RENC), Belgrade (RENC), Benton (RENC), Blanchard Township (RENC), Camden (CNC), Cape Elizabeth (PVT), China (RENC), Clinton (RENC), Corinna (RENC), Durham (RPWC), Fairfield (RENC), Hartland (RENC), Jefferson (RENC), Lebanon (CNC), Lewiston (MFS), Litchfield (CNC), Madrid Township (CNC), Mount Desert (PROC, UVM), Mount Vernon (MFS, RENC), New Portland (RENC), Newport (RENC), Norridgewock (RENC), Orrington (RENC), Reed Plantation (CNC), Scarborough

(RENC), Searsport (UNH), Sidney (PVT), Southwest Harbor (PROC), T1 R9 WELS (RENC), T4 R10 WELS (CNC), T8 R5 WELS (CNC), Township 6 North of Weld (RENC), Troy (RENC), Vienna (RENC), Waterford (CNC), Waterville (RENC), Whitefield (RENC), Whiting (CNC), Winslow (RENC), Winthrop (CNC).

***Pterostichus melanarius* (Illiger) (Plate 41)**

**Habitat:** Abundant in cultivated land and other disturbed sites, pastures, gardens, and forest edges.

**Flight dynamics:** Wings dimorphic. In Europe, predominantly vestigially winged but in New England mostly fully winged; many light trap records. This flight capability undoubtedly has assisted in its rapid spread in North America.

**Biology:** Mating and egg-laying occur in August and September, larvae overwinter as third instars, teneral adults emerge in spring and summer; adults also overwinter. Larvae often are turned up when cultivating garden soil. Adults and larvae have been observed feeding on earthworms in summer, but adults have also been reported to damage strawberries.

**General range:** An Old World species adventive in the New World. In the Old World, in the British Isles, Scandinavia, south to northern Spain, southern Italy, Bulgaria, the Caucasus, east to Lake Baikal. Introduced into Nova Scotia before 1926. Northeast to Newfoundland, in Québec north to Anticosti and Abitibi, in Ontario north to Thunder Bay, in Manitoba north to Selkirk, in Saskatchewan and Alberta; in southwest British Columbia (separate introduction before 1927 at Oliver, BC), Vancouver Island, and on the west coast from Washington to California, south to Idaho, Montana, Indiana, Ohio, Pennsylvania, and New York. In northern Vermont by 1950, southern Vermont by 1958, and Connecticut by 1972.

**Maine localities (47):** Albion (RENC), Anson (CNC), Ashland (MFS), Auburn (MFS), Bangor (MFS), Belgrade (RENC), Big Moose Township (CNC), Brewer (MFS), Brownville (CNC), Brunswick (MFS), Camden (CNC), Carrabassett Valley (CNC), Chain of Ponds Township (CNC), Corinna (RENC), Edmunds Township (CNC), Eustis (CNC), Fairfield (PVT, RENC), Fort Kent (CNC), Garland (RENC), Gorham (PVT), Gray (PVT), Lewiston (MFS), Madrid Township (CNC), Milbridge (MFS, RENC), Moro Plantation (CNC), Islesboro (PVT), Mount Katahdin Township (RENC), Mount Vernon (MFS), New Sharon (RENC), Norridgewock (RENC), Orono (MFS), Portage Lake (MFS), Readfield (MFS), Reed Plantation (CNC), Sabattus (RENC), Sidney (PVT, RENC), Squapan

Township (CNC), T11 R10 WELS (MFS), T12 R15 WELS (MFS), T2 R4 WELS (CNC)m T4 R10 WELS (CNC), T9 R5 WELS (MFS), Tremont (RENC), Warren (MFS), Washburn (RENC), Waterville (PVT, RENC), West Forks Plantation (CNC).

***Pterostichus mutus* (Say) (Plate 41)**

**Habitat:** Common forest-edge species, flourishes in suburban gardens, small patches of forests and hedge rows, also in pastures, gravel pits, thin woods, or along forest trails.

**Flight dynamics:** Fully winged, no flight records, but specimens from the top of Mt. Washington suggest flight capability.

**Biology:** A typical spring breeder, gravid females appear in May, teneral adults emerge from April into October; hibernation takes place in the adult stage.

**General range:** A northeastern and north-central North American species. Northeast to Newfoundland, in Québec north to Lac St. Jean, Abitibi and Mistassini, in Ontario north to Sudbury, in Manitoba north to Winnipeg, west to Montana, Colorado and New Mexico, south to Nebraska, Iowa, Illinois, West Virginia, and North Carolina. Isolated populations in central British Columbia and on Vancouver Island are thought to be human introductions.

**Maine localities (36):** Albany Township (CNC), Anson (CNC), Arrowsic (RENC), Auburn (RENC), Augusta (RENC), Belgrade (RENC), Buckfield (RENC), Camden (CNC), Caratunk (RENC), Carrabassett Valley (CNC, PVT), Chain of Ponds Township (CNC), Columbia Falls (CNC, RENC), East Millinocket (CNC), Eustis (CNC), Fairfield (RENC), Fryeburg (RPWC), Gouldsboro (PROC), Hanover (UVM), Isle Au Haut (MCZ), Islesboro (PVT), Lewiston (MCZ), Mount Vernon (MFS, RENC), Naples (CNC), Oakland (RENC), Phippsburg (RENC), Reed Plantation (CNC), Sanford (CNC), T1 R9 WELS (RENC), T3 R10 WELS (RENC), Topsham (RENC), Turner (RENC), Upton (CNC), Waterville (RENC), Wells (RENC), West Forks Plantation (CNC), Woolwich (MFS).

***Pterostichus patruelis* (Dejean) (Plate 41)**

**Habitat:** Emergent vegetation in all sorts of marshes, fens, and bogs, particularly common in beaver ponds and lodges.

**Flight dynamics:** Wings dimorphic; multiple light trap records, and recorded from both mountain tops and lake drift.

**Biology:** Teneral adults appear from August to mid-November.

**General range:** A northern transcontinental species. Northeast to Labrador and Newfoundland, in Québec north to James Bay, in Ontario north to Cochrane and Longlac, in Alberta north to Edmonton, in British Columbia north to Liard River Hot Springs, in Alaska west to Anchorage and Kenai Peninsula, south to Montana, Kansas, Missouri, Illinois, Ohio, West Virginia, and Virginia.

**Maine localities (35):** Alfred (RENC), Appleton (RPWC), Athens (RENC), Bar Harbor (PROC), Baring Plantation (CNC), Batchelders Grant Township (RENC, UVM), Belgrade (PVT, RENC), Cape Elizabeth (PVT, RENC), Carrabassett Valley (PVT, RENC), Chain of Ponds Township (CNC), Corinna (RENC), Fairfield (RENC), Georgetown (MFS, UVM), Hartland (RENC), Jefferson (RENC), Kibby Township (MFS), Lewiston (MFS), Mount Desert (UVM), Mount Katahdin Township (PVT), Newport (RENC), Northeast Carry Township (RPWC), Oakfield (RPWC), Oakland (RENC), Phippsburg (RENC), Rumford (CNC), Sanford (RPWC), Scarborough (PVT, RENC), Sidney (RENC), T1 R9 WELS (RENC), T2 R9 WELS (RENC), T4 R10 WELS (CNC), Troy (RENC), Waterford (CNC), Wayne (CNC), Woodland (UNH).

***Pterostichus pensylvanicus* LeConte (Plate 41)**

**Habitat:** Deciduous or mixed forest in leaf litter, in contrast to *P. adstrictus* which is mainly in logs and leaf litter in more conifer-dominated environments.

**Flight dynamics:** Wings vary in size, making the species functionally dimorphic.

**Biology:** A typical spring breeder, with hibernation in the adult stage. Teneral adults appear from April into June and again in mid-September to mid-November; eggs are laid in soil, in contrast to *P. adstrictus* which lays its eggs in logs; larvae live in the leaf litter.

**General range:** A nearly transcontinental northern species, but not reaching West Coast. Northeast to Newfoundland, in Québec north to Tadoussac, Chicoutimi, and Lac Mistassini, in Ontario north to Lake Timagami, Longlac, and Lake Nipigon, in Saskatchewan north to Saskatoon, in the Northwest Territories to Ft. Smith, in British Columbia west only to the Coast Range at Vernon, south to South Dakota, Illinois, Indiana, Ohio, West Virginia, and Virginia.

**Maine localities (58):** Allagash (MFS), Anson (RENC), Augusta (MFS), Bar Harbor (CNC, MFS, PROC), Batchelders Grant Township (RENC), Beddington (MFS), Belgrade (RENC), Bethel (CNC), Bridgton (MFS), Byron (CNC), Camden (CNC), Cape Elizabeth

(PVT, RENC), Casco (PVT), Cornish (CNC), Edmunds Township (CNC), Fairfield (RENC), Gilead (CNC), Islesboro (PVT), Jackman (CNC), Lebanon (UNH), Lee (RPWC), Lewiston (MFS), Lyman (CNC), Milbridge (MFS), Moscow (RENC), Mount Desert (UVM), Mount Katahdin Township (MFS, RENC), Mount Vernon (MFS), Naples (CNC), Nashville Plantation (MFS), Nesourdnahuk Township (CNC), Oakland (RENC), Owls Head (PVT), Oxbow Plantation (MFS), Oxford (CNC), Phippsburg (RENC), Salem Township (RENC), Sidney (RENC), Skowhegan (RENC), Steuben (RENC), Sweden (CNC), T10 R3 WELS (MFS), T11 R7 WELS (MFS), T11 R8 WELS (MFS), T14 R6 WELS (MFS), T14 R7 WELS (MFS), T2 R4 WELS (CNC), T3 R8 WELS (RENC), T8 R8 WELS (MFS), T9 R5 WELS (MFS), T9 R7 WELS (MFS), Washburn (RENC), Washington (RENC), Waterville (RENC), Winslow (RENC), Winthrop (CNC), Woolwich (MFS), York (PVT, RENC).

***Pterostichus pinguedineus* (Eschscholtz) (Plate 41)**

**Habitat:** In the Arctic tundra on till or other well-drained substrates under stones, or under leaves at river banks at northern edge of forests. In New England, mostly at or above the treeline (1,200 m), collected at 750 m in a deep, cold rock crevice.

**Flight dynamics:** Vestigially winged.

**Biology:** Gravid females appear in June and July, larvae from June into September, teneral adults appear mostly in August and September, but there is one record from early June.

**General range:** A northern Holarctic species. From Ural Mountains of Siberia east to the tundra of the Mackenzie Delta in the northern Yukon Territory, including islands of the Bering Sea, the Aleutians, and Kodiak Island, in Alaska south of Valdez and Kenai Peninsula, absent from central and eastern Arctic, but relict populations are found in high mountains of Gaspé, Adirondacks, Green Mountains of Vermont, the White Mountains of New Hampshire, and Mt. Katahdin in Maine.

**Maine locality (1):** Mt. Katahdin Township (CNC).

***Pterostichus praetermissus* (Chaudoir) (Plate 41)**

**Habitat:** Wet ground, in wet meadows and marshes or along low-gradient streams, generally on fine-grained substrates with at least some organic component. In the Northeast, usually in leaf litter and sphagnum in forested bogs (northern white cedar), red maple swamps, or on margin of open white cedar bogs. Can be frequent in leaf litter on vernal pond margins in these habitats.

Flight dynamics: Fully winged, but flight has not been observed.

Biology: Overwinters as adult; breeding takes place in the spring.

General range: Southern Ontario and Québec and adjacent USA.

Maine localities (4): Hiram (CNC), Lebanon (CNC), Lyman (CNC), Sanford (CNC, RPWC).

***Pterostichus punctatissimus* Randall (Plate 41)**

Habitat: Coniferous and mixed forests, under logs, stones, moss mats and within moss-covered rotten logs. Also in cold bogs at lower elevations. The only North American member of the subgenus not restricted exclusively to tundra environments.

Flight dynamics: Vestigially winged.

Biology: Mating occurs in June into August; most overwinter as third instars, but some overwinter as adults; pupation takes place in May to July, and teneral adults emerge from July into September. Emits defensive secretion with odor of mocha-chocolate.

General range: A northeastern and north-central North American species. Northeast to Labrador and Newfoundland, in Québec north to Ungava Bay, in Ontario and Manitoba north to Hudson Bay, in Northwest Territories north to Aklavik, west to Watson Lake, Yukon, south to Edmonton, Alberta, Saskatoon, Saskatchewan, Lake Winnipeg, Manitoba, Minnesota, northern Michigan, in Ontario south to Lake Superior, in Québec south to Montreal and Québec City, south to New Brunswick and Nova Scotia. Relict populations in high mountains and plateaus of northern New York, Vermont, New Hampshire, Maine, and Massachusetts, as well as the higher mountains of southern Québec.

Maine localities (7): Avon (PVT), Frenchtown Township (CNC), Kibby Township (MFS), Spencer Bay Township (MFS), T14 R6 WELS (MFS), T6 R11 WELS (UVM), T7 R15 WELS (MFS).

***Pterostichus rostratus* (Newman) (Plate 42)**

Habitat: Deciduous, mixed forest in and under logs, often fairly deeply if the surface is dry; also under leaf litter.

Flight dynamics: Vestigially winged.

Biology: Breeds in late spring and summer, teneral adults appear in late summer, overwinter as new adults.

General range: An Appalachian species. Northeast to New Brunswick, in Québec north to Montmorency County and Sorel, in Ontario west to Toronto, southwest to Pennsylvania, West Virginia, down the Appalachians to the Carolinas, Tennessee, and Georgia.

Maine localities (29): Anson (RENC), Augusta (MFS), Bar Harbor (PROC, UVM), Batchelders Grant Township (MFS, UVM), Belgrade (RENC), Bridgton (MFS), Buckfield (RENC), Carrying Place Township (MFS), Fairfield (RENC), Grafton Township (CNC), Kibby Township (MFS), Lee (RPWC), Lewiston (MFS), Mount Desert (PROC), Mount Vernon (MFS), Nesourdnahunk Township (CNC), Oxbow Plantation (MFS), Parsonsfield (RPWC), Readfield (UNH), Sidney (RENC), South Berwick (PVT), T18 ED BPP (MFS), T3 R8 WELS (MFS), T4 R10 WELS (CNC), T8 R5 WELS (MFS), Waterford (CNC), Waterville (RENC), Wells (PVT), York (PVT).

***Pterostichus stygicus* (Say) (Plate 42)**

Habitat: Deciduous forests, forest edges, under logs, stones, or bark. In higher or cooler areas, sometimes in gardens and pastures. Compared to the related *P. coracinus*, it is less strictly a forest species.

Flight dynamics: Vestigially winged.

Biology: Serological evidence indicates predation on gypsy moth caterpillars. Teneral adults appear in late July. Hibernation likely takes place in both the larval and adult stages.

General range: An eastern and central North American species. Northeast to central Maine, in Québec north to Montmorency County, in Ontario north to Toronto and Belleville, west to Michigan and Wisconsin, northwest to Minnesota, southwest to Iowa, Kansas, and Missouri, south to Louisiana, Mississippi, Georgia, and South Carolina.

Maine localities (22): Acton (RPWC), Anson (RENC), Athens (RENC), Augusta (MFS), Bar Harbor (MFS, PROC), Buckfield (RENC), Camden (CNC), Fairfield (PVT, RENC), Garland (RENC), Lewiston (MFS), Long Pond Township (CNC), Monmouth (UNH), Moscow (RENC), Mount Desert (PROC, UNH), Moscow (RENC), Mount Desert (PROC, UNH), Naples (CNC), Orono (UNH), Orrington (MFS), Sandy River Plantation (CNC), Sanford (CNC), T3 R8 WELS (RENC), Waterford (CNC), Waterville (RENC).

***Pterostichus tenuis* (Casey) (Plate 42)**

Habitat: Often in sphagnum but not confined to bogs or fens, also in patches of sphagnum in wet forest areas or above treeline, although also found in wet or marshy areas totally lacking sphagnum.

Flight dynamics: Fully winged, in light trap records.

Biology: Adults congregate to hibernate. Hibernation in the adult stage; typical spring breeder, with

gravid females appearing from spring into early summer.

**General range:** An eastern and central North American species. Northeast to Newfoundland, in Québec north to Mistassini, north to Manitoba and Saskatchewan, northwest to Ft. McMurray in Alberta, southwest to Colorado, absent from US Great Plains, but south to Minnesota, Iowa, Illinois, Indiana, Ohio, West Virginia, and Virginia.

**Maine localities (7):** Acton (CNC), Appleton (RPWC), Kibby Township (MFS), Sanford (RPWC), T8 R5 WELS (CNC), Tremont (UVM), Whiting (CNC).

***Pterostichus tristis* (Dejean) (Plate 42)**

**Habitat:** In deciduous forest often with *P. adoxus* but usually found under logs while *P. adoxus* is found in logs, though this discrimination based on microhabitat may not always be absolute.

**Flight dynamics:** Vestigially winged.

**Biology:** General adults appear in late May, and also in July and late August; hibernation in both the larval and adult stages.

**General range:** An eastern and central species. Northeast to Nova Scotia, in Québec north to Saguenay, Gaspé and Mt. Tremblant, north to southern Ontario and Michigan, northwest to Wisconsin, west to Illinois, south to Tennessee, Georgia, and North Carolina.

**Maine localities (40):** Alfred (RENC), Auburn (RPWC), Augusta (MFS), Bar Harbor (MFS), Batchelders Grant Township (MFS, UVM), Bigelow Township (UVM), Bridgton (MFS), Caratunk (CNC), Carrabassett Valley (PVT), Edmunds Township (CNC), Fryeburg (RPWC), Islesboro (PVT), Kibby Township (MFS), Lebanon (UNH), Lee (RPWC), Monhegan Island Plantation (UVM), Moro Plantation (CNC), Mount Desert (UVM), Naples (CNC), Nesourdnahunk Township (CNC), Newry (UVM), Oxbow Plantation (MFS), Oxford (CNC), Parsonsfield (MFS, RPWC), Phippsburg (MFS, RENC), Saint Croix Township (MFS), Sweden (MFS), T11 R7 WELS (MFS), T14 R7 WELS (MFS), T16 R4 WELS (MFS), T2 R4 WELS (CNC), T4 R10 WELS (CNC), T5 R18 WELS (RPWC), T6 R11 WELS (UVM), T8 R8 WELS (MFS), T9 R5 WELS (MFS), Trout Brook Township (UNH), West Forks Plantation (CNC), Winthrop (CNC), York (PVT).

**Tribe Zabrini**

**Genus *Amara***

***Amara aenea* DeGeer (Plate 5)**

**Habitat:** Grasslands, pastures, gardens, and croplands.

**Flight dynamics:** Wings full, frequent flier, makes spring dispersal flights.

**Biology:** Strongly diurnal, has been observed feeding on cereal grains in Europe.

**General range:** Widespread Palearctic species, adventive in North America. Found throughout Europe except for the extreme north, south to North Africa, the Caucasus, Turkmenistan, Afghanistan, and the Himalaya, east to Lake Baikal region. Adventive in North America, in New England by 1828. Northeast to Newfoundland, in Québec northeast to the North Shore and Abitibi, west to Minnesota, Missouri, Oklahoma, south to Arkansas, Mississippi, and South Carolina. Isolated on West Coast from California north to Washington.

**Maine localities (7):** Augusta (UNH), Bangor (MFS), Lebanon (UNH), Lincoln (CNC), Mount Vernon (MFS), Orono (MFS), Unity (MFS).

***Amara aeneopolita* Casey (Plate 5)**

**Habitat:** Open dry grassland on firm soil, within the northern coniferous forest region.

**Flight dynamics:** At least some specimens are fully winged; Lindroth recorded specimens in drift in Newfoundland.

**Biology:** Diurnal, adults generally more common in early summer.

**General range:** From Newfoundland to the Northwest Territories of Canada, south to Iowa, Michigan, New York, and New England.

**Maine localities (2):** Codyville Plantation (RPWC), Lincoln Plantation (RPWC).

***Amara alpina* Paykull (Plate 5)**

**Habitat:** Usually found under flat stones on alpine tundra or well-drained substrates in lowland tundra settings.

**Flight dynamics:** Wings dimorphic, no flight observations.

**Biology:** Unknown; at least in northern part of range, this species must overwinter in both larval and adult stages since multiple years are required to complete a life cycle.

**General range:** A circumpolar, far northern species. In the Eastern Hemisphere, northern Scotland, far northern Scandinavia, northern Russia, Siberia, Novaya Zemlya Island, and the Kuril Islands to Bering Strait. In North America, in Newfoundland only on the northern peninsula, in Labrador, to the northern tip, in northern Canada and Alaska apparently reaching the ocean at all points, in the Arctic Islands north to Devon Island (northernmost record for any species of ground beetle), west in Alaska to St. Lawrence Island, St. Matthew Island and the Pribilof Islands; many Alaska records are either coastal or montane, but this

is likely a reflection of collecting rather than occurrence. South on the coast to Prince Rupert, British Columbia, south in the Rockies to New Mexico, but not in the Sierra Nevada or Cascades; in the east, not south of the coastal tundra except relict populations in the mountains of New York, New Hampshire, Maine and on the Gaspé Peninsula of Québec.

Maine localities (1): Mt. Katahdin Township (CNC, RENC).

***Amara angustata* (Say) (Plate 6)**

Habitat: In tall grasses.

Flight dynamics: Fully winged.

Biology: Sometimes climbs grass stalks in order to feed on flowers. Until recently two other species, *Amara angustatoides* Hieke and *Amara flebilis* (Casey) were included within this species; ecological differences of these are still unknown.

General range: Eastern North America, Northeast to Maine and Montreal, west through Manitoba to eastern British Columbia, south to Colorado, Arkansas, Alabama, and South Carolina.

Maine localities (6): Bar Harbor (PROC), Cutler (CNC), Fairfield (RENC), Hancock (CNC), Mount Desert (PROC), Waterville (RENC).

***Amara angustatoides* Hieke (Plate 6)**

Habitat: In tall grasses. (see note under Biology for *A. angustata*).

Flight dynamics: Fully winged.

Biology: Sometimes climbs grass stalks in order to feed on flowers. Until recently, this species and *A. flebilis* were included within *A. angustata*; ecological differences of these are still unknown.

General range: An eastern species. Northeast to New Brunswick, north in Québec to Montreal, in Ontario north to Toronto; west to Minnesota and Iowa, south to Ohio and Maryland.

Maine localities (6): Cumberland (PVT), East Machias (PVT), Lewiston (PVT), Old Orchard Beach (PVT), Paris (PVT), South Bristol (PVT).

***Amara anthobia* Villa and Villa (Plate 6)**

Habitat: Sandy ground with sparse vegetation, often on cultivated soil.

Flight dynamics: Fully winged, found in seashore drift indicating flight.

Biology: Unknown.

General range: A Palaearctic species, adventive in North America. In Europe, it ranges from the Mediterranean north to England, Denmark, southern Sweden, east to southern Ukraine and Armenia. In North America, found on the west coast from Washington to California, in the east from Maryland and Virginia, with an isolated record from Maine.

Maine localities (1): Monmouth (UNH).

***Amara apricaria* (Paykull) (Plate 6)**

Habitat: In pastures, gardens, and dry open areas; in western wheat fields.

Flight dynamics: Wings full, common at light traps, a frequent flier.

Biology: Overwinters both as larva and adult and has been observed eating inflorescences of grasses.

General range: Either a naturally circumpolar species or an early introduction from the Old World. Most of Eurasia, in Europe south to southern Spain and Greece, in Asia, south to Armenia and Kashmir, east to Mongolia and the Amur and Lena Rivers. In North America, Newfoundland and Labrador west to Québec north to Schaefferville and Inoucdjouac, and northwest to the Northwest Territories and Yukon, in British Columbia, west to Quesnel and Osoyoos (but not in the humid coastal belt), in the USA south to Oregon, Colorado, Kansas, Alabama, and Georgia.

Maine localities (11): Allagash (UNH), Bar Harbor (PROC), Dennistown Plantation (UNH), Enfield (MFS), Lewiston (MFS), Mount Vernon (MFS), Southwest Harbor (PROC), T16 R5 WELS (MFS), T17 R4 WELS (UNH), T3 R11 WELS (MFS), Topsfield (MFS).

***Amara aulica* (Panzer) (Plate 6)**

Habitat: Rich meadows with tall vegetation, also in corn and potato fields.

Flight dynamics: Fully winged, flight observed in Europe .

Biology: Feeds largely on seeds, commonly grasses or composites, also larvae infesting seeds, climbs the vegetation at night to feed. Breeding period in autumn, teneral adults emerge in early summer.

General range: An adventive species. In Europe, north to Scandinavia and Russia, in the British Isles and the Faroes south to the mountains of northern Spain, central Italy, Greece, and the Caucasus; in Asia, in the mountains of central Asia and widespread in Siberia, east to the Transbaikal region. In North America, first recorded during 1929 in Cape Breton, Nova Scotia; known now to range from Newfoundland west to the north shore to the St. Lawrence Valley of Québec, and west to Montreal. In the USA, only in New Hampshire and Maine (region around Portsmouth, New Hampshire).

Maine localities (1): Brunswick (RENC).

***Amara avida* (Say) (Plate 6)**

Habitat: Dry weedy ground of roadsides and pastures, most common in sandy areas.

Flight dynamics: Fully winged, multiple flight observations.

Biology: Teneral adults have been observed emerging from May into September.

General range: Eastern North America. Northeast to Newfoundland, in Québec north to Lac St. Jean and Abitibi, in Ontario north to Thunder Bay, in Saskatchewan, west to Creston, British Columbia; south into Montana, Kansas, Missouri, Indiana, and Virginia.

Maine localities (5): Bar Harbor (CNC), Eustis (CNC), Garfield Plantation. (MFS), Southwest Harbor (PROC), Washington (RENC).

#### ***Amara bifrons* (Gyllenhal) (Plate 6)**

Habitat: Dry open sand areas including cultivated fields.

Flight dynamics: Fully winged, a good flier, often coming to lights.

Biology: Nocturnal; hides by day under leaf rosettes, reproduces in the fall.

General range: Old World species, adventive in North America. In Europe, from the British Isles and southern Scandinavia, south to Portugal and central Italy, east to Bulgaria and Caucasus; in Asia, south to Armenia, Kyrgyzstan, east to Lake Baikal. Oldest North American record is from Nova Scotia in 1929, Northeast to Newfoundland and Labrador, in Québec north to Poste-de-la-Bellechasse County, south to New Brunswick and extreme northern Maine and New Hampshire.

Maine localities (10): Allagash (UNH), East Millinocket (CNC), Eustis (UNH), Lincoln (CNC), T16 R5 WELS (UVM), T17 R4 WELS (UNH), Cross Lake Township (UNH), T9 R5 WELS (MFS), Topsfield (MFS), Waterville (RENC).

#### ***Amara chalcea* Dejean (Plate 6)**

Habitat: Open sandy areas under debris and among grass clumps.

Flight dynamics: Fully winged, no flight records.

Biology: In Vermont, a teneral individual was observed on 8 July.

General range: North to southern Maine, New Hampshire, Vermont, New York, southern Ontario, Michigan, Wisconsin, west to Colorado, south to Texas and Georgia.

Maine localities (1): Fryeburg (RPWC).

#### ***Amara convexa* LeConte (Plate 6)**

Habitat: Grasslands on sand or gravel, roadsides, abandoned fields and sand and gravel pits; primarily a prairie species with an eastern extension into the Canadian Maritimes.

Flight dynamics: Fully winged, recorded from lake drift (indirect evidence for flight).

Biology: Teneral individuals reported in Alberta and Manitoba in August by Lindroth (1968); undoubtedly overwinters as an adult.

General range: A widespread species in the interior plains but also some eastern records. Northeastern limit in Nova Scotia, in Québec northeast to Lac St. Jean, in Ontario north to Timagami and Thunder Bay, in Alberta north to Fort McMurray, west to inland British Columbia, but not reaching the coast. In the USA, west to Idaho and Utah, south to New Mexico, Colorado, Nebraska, Illinois, Ohio, and Maryland.

Maine localities (1): Ogunquit (CNC).

#### ***Amara crassispina* LeConte (state record only from Bousquet (2010))**

Habitat: On open ground with discontinuous vegetation – fields, grasslands, etc.

Flight dynamics: Fully winged, occasionally found in wind-drift material. Not known to be attracted to lights.

Biology: Overwinter as adults, which may be encountered year-round.

General range: East of the Rockies, generally only in the USA from Colorado south to Texas, east to Florida, north to New York and New Hampshire, though not recorded from Vermont.

Maine localities: No specific Maine localities known.

#### ***Amara cupreolata* Putzeys (Plate 7)**

Habitat: Dry, sparsely vegetated areas such as gravel pits, rock ledges, lawns and gardens, and wheat fields. In New England, on alpine tundra.

Flight dynamics: Hind wings present but proportionately small; Lindroth thought it unlikely to be capable of flight. No flight observations.

Biology: Diurnal, at least in part. Taken on goldenrod, teneral adults found in April; often seeks shelter under basal rosettes of plants.

General range: A wide-ranging species, nearly transcontinental in the north. Northeast to Newfoundland, in Québec north to Lac St. Jean, in Ontario north to Ottawa, Saskatchewan, Northwest Territories down the Mackenzie River to Norman Wells, scarcely reaching beyond the Rocky Mountains. In the west, in British Columbia west to Trail, south into Montana, Utah, Colorado, Arkansas, Alabama, and Georgia.

Maine localities (10): Bar Harbor (PROC), Fryeburg (RPWC), Kibby Township (MFS), Shapleigh (RPWC), Squapan Township (CNC), T11 R8 WELS (MFS), T14 R6 WELS (MFS), T9 R3 WELS (MFS), Washburn (RENC).

***Amara erratica* (Duftschmid) (Plate 7)**

**Habitat:** Dry grassy areas, usually in boreal forest areas and on the tundra.

**Flight dynamics:** Fully winged, no flight records.

**Biology:** In Europe, egg-laying occurs in the spring, larvae appear in summer; both larvae and adults enter hibernation in the fall.

**General range:** Circumpolar northern species. In Europe, in the far north of Scandinavia and northern Russia, across Siberia to the Pacific Ocean and Bering Strait, isolated in the Alps and Caucasus. In North America, found east to Newfoundland and Labrador, apparently all of northern Québec, in the Northwest Territories north to Aklavik, west to Alaska, British Columbia, south in the mountains to California and Colorado, in eastern Canada south to Lac St. Jean and Abitibi, New Brunswick, isolated in eastern Mountains of northern New England and the Gaspé.

**Maine localities (3):** Carrabassett Valley (CNC), Magalloway Plantation (RPWC), Paris (MFS).

***Amara familiaris* (Duftschmid) (Plate 7)**

**Habitat:** Open weedy ground, meadows, wasteland, sometimes on sand dunes.

**Flight dynamics:** Wings full, many flight records from Europe, frequently found in drift material on seashores.

**Biology:** Active in the spring. The adults feed on seeds; the species has been observed feeding in the panicles of bluegrass, *Poa* L. (Poaceae).

**General range:** An Old World species, now adventive in the New World. In Europe, north to Scandinavia, west to Great Britain and Ireland, south to North Africa, Greece, southern Russia to Kazakhstan and northern Mongolia, east to the Pacific. Probably multiple introductions to North America; the oldest records are from Boston, Massachusetts (1918) and Vancouver, British Columbia (1919). In North America, found on both coasts, Nnortheast to Newfoundland, in Québec north to Abitibi, west to Illinois, Missouri, south to Tennessee and South Carolina; in the west from Alaska to California, with a few scattered records in between from Montana and Alberta. Probably still spreading.

**Maine localities (8):** New Sharon (RENC), Newry (UNH), Oxbow Plantation (MFS), Paris (MFS), Portage Lake (MFS), South Berwick (CNC), T15 R5 WELS (MFS), Waterville (RENC).

***Amara flebilis* (Casey) (Plate 7)**

**Habitat:** In New Brunswick, adults were found under drift material on a sea beach.

**Biology:** In New Brunswick, adults were active in early June.

**General range:** In the Northeast to Nova Scotia and New Brunswick, north to Montreal area, Québec, west to Manitoba, North Dakota, southwest to Arizona, south to Illinois and Virginia.

**Maine localities (4):** Cutler (PVT), Hancock (PVT), Paris (PVT), Wales (PVT).

***Amara gibba* (LeConte) (Plate 7)**

**Habitat:** Open, sandy ground, sand pits.

**Flight dynamics:** Wings dimorphic, fully winged form has been taken in seashore drift; brachypterous forms are known, particularly in the West.

**Biology:** Lindroth reported teneral specimens from Kodiak Island (Alaska) during August.

**General range:** Transcontinental, mainly northern. Northeast to Labrador, in Québec north to Great Whale River, in Alberta north to Jasper, in Northwest Territories north to Yellowknife, in British Columbia west to Hope; in the USA, south in the mountains to California and Colorado, south to South Dakota, New Jersey, and Long Island, New York.

**Maine localities (1):** Fryeburg (RPWC).

***Amara impuncticollis* (Say) (Plate 7)**

**Habitat:** Unknown. *Amara turbata* Casey, *Amara otiosa* Casey, and *Amara ovata* (F.) were recently separated from *A. impuncticollis*. Neither *A. turbata* nor *A. ovata* have yet been reported from Maine but very likely will be found in the state. At present, their habitats cannot be differentiated.

**Flight dynamics:** At least some individuals assigned to this species in the past are fully winged and likely capable of flight.

**Biology:** Unknown

**General range:** North to Québec and Ontario, west to Michigan and Wisconsin, southwest to Missouri, Kansas, Oklahoma and Texas, south through Mexico to at least Costa Rica.

**Maine localities (9):** Caratunk (RENC), Carrabassett Valley (CNC), Columbia Falls (RENC), Fairfield (RENC), Lang Township (MFS), T3 R8 WELS (MFS), Tremont (RENC), Wales (PVT), Waterville (RENC).

***Amara laevipennis* Kirby (Plate 7)**

**Habitat:** On open, dry, sandy areas, often on till or outwash, not above the treeline; also on dry, grassy ledges and in sand and gravel pits.

**Flight dynamics:** Fully winged; Lindroth reported five specimens taken in a rotary trap in Alaska.

**Biology:** Teneral adults seen in August; probably overwinters as adult.

**General range:** A northern transcontinental species. Northeast to Newfoundland, in Québec north to Schefferville, Ft. George, in the Northwest Territories to Ft. Smith in the extreme

south; in Alaska, only south of the Alaska Range, including the Kenai Peninsula; in British Columbia, apparently throughout except for Vancouver Island and the Queen Charlotte Islands, south to Washington, Idaho, Montana, mountains of Colorado, Minnesota, and northern Michigan; in Québec south to Montreal; south of there isolated in mountains of the eastern townships, western Massachusetts, Vermont, New Hampshire, Maine, New Brunswick, Nova Scotia, and Prince Edward Island.

Maine localities (5): Albany Township (CNC), Alfred (RPWC), Carrabassett Valley (CNC), Fryeburg (CNC, RPWC), Moro Plantation (CNC).

#### ***Amara lator* (Kirby) (Plate 7)**

Habitat: Open sandy areas, sometimes found in leaf rosettes in gravel pits.

Flight dynamics: Wings full, a regular flier, commonly coming to lights; specimens from the summit area of Mt. Washington, New Hampshire were probably strays.

Biology: Normal hibernation as late-instar larva, occasionally as adults; teneral adults normally emerge in late spring. Frequent at lights in New Brunswick.

General range: A transcontinental species. Northeast to Newfoundland (though doubtfully established there), in Québec north to Abitibi, in northwestern Ontario, north to Sioux Lookout; in Alberta north to Fort McMurray, west in British Columbia to Vancouver Island, in all of the western mountains; east of the Rockies, south to Nebraska, Iowa, Kentucky, Pennsylvania, and New York.

Maine localities (4): Bethel (CNC), Mount Vernon (MFS), Skowhegan (MFS), Steuben (MFS).

#### ***Amara littoralis* Dejean (Plate 7)**

Habitat: Open, moderately dry ground with more or less discontinuous weedy cover. Probably favored by human disturbance.

Flight dynamics: Wings full.

Biology: Teneral adults seen from April and September, gravid female observed in mid-June.

General range: Virtually all of North America north of Mexico. Northeast to Newfoundland, in Québec north to Lake Mistassini, in Ontario north to Moose Factory, in the Northwest Territories, the entire Mackenzie River Valley to Reindeer Depot, in Alaska known only from the south coast, west in British Columbia to the Queen Charlotte Islands, south to California, Texas, and Georgia.

Maine localities (7): Bar Harbor (CNC, PROC), Fryeburg (CNC), Lewiston (MFS), Mount

Vernon (MFS), Saint Francis (CNC), T15 R10 WELS (MFS), T4 R10 WELS (CNC).

#### ***Amara lunicollis* Schiødte (Plate 8)**

Habitat: On dry ground, meadows, grassland, arable land, moss on rock ledges.

Flight dynamics: Fully winged, no flight observations.

Biology: Predominantly diurnal, mating occurs in late July; in Europe, overwinters as adult.

General range: Circumpolar in the forested north; in the Old World, from British Isles and Scandinavia south to northern Spain, Italy, Bulgaria, Armenia, Kyrgyzstan, and Mongolia; east to the Pacific and Bering Strait. In North America, Northeast to Newfoundland and extreme southern Labrador, in Québec north to Abitibi, in Ontario north to Sioux Lookout, in the Northwest Territories north to Norman Wells, in the Yukon north to Dawson, west to Alaska to Fairbanks and Kenai Peninsula, in British Columbia, not reaching the coast; in USA, not in the western states, but east of the Rockies, south to Minnesota, New York, Pennsylvania, and New England.

Maine localities (3): Bar Harbor (UVM), Unity (PVT), Winthrop (MFS).

#### ***Amara musculus* (Say) (Plate 8)**

Habitat: Waste ground, sand and gravel pits, under plant rosettes in lawns and gardens.

Flight dynamics: Wings full, abundant at light traps, a frequent flier.

Biology: Sometimes common on goldenrod flowers.

General range: Transcontinental. Northeast to Nova Scotia and New Brunswick, in Québec, north to Québec City and Abitibi, in Manitoba north to Lake Winnipeg, in Alberta, north to Edmonton, in British Columbia, in the southern dry areas of the interior only, south into Washington, Oregon, California, as well as Arizona, New Mexico, Kansas, Oklahoma, Mississippi, Alabama, and Florida (apparently unknown from Texas or Louisiana).

Maine localities (5): Allagash (UNH), Skowhegan (PVT), Waterford (CNC), Waterville (PVT), Wilton (CNC).

#### ***Amara neoscotica* Casey (state record only from Bousquet (2010, 2012))**

Habitat: Dry, well-drained, gravelly or sandy substrates, open ground, such as in abandoned fields and vacant lots.

Flight dynamics: Fully winged, but flight has not been observed.

Biology: Unknown.

General range: Unclear since the species was long synonymized with *A. cupreolata* by Lindroth

(1954) and Bousquet and Laroche (1993); Bousquet (2010) lists its range in the Northeast as including Nova Scotia, New Brunswick, Québec, Maine, and Vermont.

Maine localities: No specific Maine localities known.

***Amara obesa* (Say) (Plate 8)**

Habitat: Dry, open ground with sparse vegetation, in open fields and gardens

Flight dynamics: Wings dimorphic, apparently no flight observations, but records from Mt. Washington are evidence for occasional flight.

Biology: Gravid females appear in late June, teneral adults mostly will be found in late June and July, but a few may emerge in the fall. Feeds largely on grasshopper egg masses.

General range: Transcontinental species. Widespread species but absent from the southeastern coastal states. Northeast to Newfoundland, in Québec, north to Chicoutimi and Lake Mistassini, in Ontario, north to Nipigon, north to Saskatoon, Saskatchewan, in the Northwest Territories to Ft. Simpson, northwest to Yukon, in British Columbia west to Vancouver, south to Arizona, New Mexico, Oklahoma, Tennessee, and South Carolina.

Maine localities (4): Caratunk (RENC), Islesboro (PVT), Mount Vernon (MFS), Norridgewock (RENC).

***Amara otiosa* Casey (Plate 8)**

Habitat: Cultivated fields, orchards, and alpine and subalpine areas.

Flight dynamics: Unknown at present; see *A. impuncticollis*.

Biology: Unknown at present; see *A. impuncticollis*.

General range: Northeast to Newfoundland, in Québec north to Temiscamingue, in Ontario north to Ottawa, Rainy River, west to Minnesota, Missouri, and Texas, south to North Carolina and Pennsylvania.

Maine localities (5): Carrabassett Valley (PVT), Monmouth (PVT), Mount Katahdin Township (PVT), Mount Vernon (PVT), Wilton (PVT).

***Amara pallipes* Kirby (Plate 8)**

Habitat: Among grasses, waste ground, gravel pits, or meadows, borders of beaver ponds.

Flight dynamics: Fully winged, no flight records.

Biology: Has been observed feeding on various grass inflorescences, including timothy (*Phleum pratense* L.; Poaceae).

General range: A northern transcontinental species. Northeast to Cape Breton Island, Nova Scotia, in Québec north to Grandes Bergeronnes and Lac St. Jean, in Manitoba, north to The Pas, in the Northwest Territories north to Ft. Smith,

west in British Columbia to Vancouver Island, south to Washington, Idaho, Nebraska, Tennessee, and Virginia.

Maine localities (4): Bethel (CNC), Caratunk (RENC), Magalloway Plantation. (RPWC), Waterville (RENC).

***Amara patruelis* Dejean (Plate 8)**

Habitat: Open, dry ground including gardens, fallow fields, and tundra.

Flight dynamics: Fully winged, diurnal flight observed in spring.

Biology: Teneral adults in July, diurnal, commonly seen crossing sidewalks in late spring. In New Brunswick, observed in March on bare soil when deep snow cover still present nearby.

General range: Transcontinental species, also in eastern Siberia. Northeast to Newfoundland, in Québec north to Lake Mistassini, in Ontario north to Hudson Bay, in the Northwest Territories down the Mackenzie River to Reindeer Depot, in Alaska, north to Umiat on the Colville River, on the western coast from Nome to Skagway, but not in the Aleutians; in British Columbia, west only to the east side of the coast range, south to California, Utah, Colorado, South Dakota, Iowa, Kentucky, and New Jersey.

Maine localities (5): Carrabassett Valley (CNC), Milbridge (MFS), Moro Plantation (CNC), Presque Isle (UVM), Winslow (PVT).

***Amara quenseli* (Schönherr) (Plate 8)**

Habitat: Sandy areas, including beaches and dunes, on sandy till and fields.

Flight dynamics: Wings polymorphic, no flight records.

Biology: Nocturnal, hides in sand and plant rosettes in the day. In Europe, has been observed eating seeds of the grasses *Polygonum*, *Galium*, and *Thymus*. Teneral adults emerge in late May and June, also in August. Likely overwinters as an adult, at least in part.

General range: Circumpolar species. In the Old World, northern, found in Scandinavia, Iceland, Scottish highlands, northern Russia, northern Siberia, also in the mountains farther south (Pyrenees, Alps, Montenegro, Carpathians, Bulgarian Mountains, Caucasus, Urals, Tian Shan). In North America, east to Newfoundland, to northern Labrador, in Québec to Ungava Bay, in Manitoba north to Hudson Bay, in the Northwest Territories north to Norman Wells, in Alaska to Fairbanks and Ramparts in the interior, north to near Umiat but not on the Arctic coast; on the Bering Sea coast from Nome southward, also on Kodiak, Aleutian, and the Pribilof Islands, south in the Mountains to

California and New Mexico, south to Oklahoma, Missouri, Ohio, Pennsylvania, and New Jersey.  
Maine localities (9): Bar Harbor (MFS, PROC), Codyville Plantation. (RPWC), Columbia Falls (CNC), Fryeburg (RPWC), Kibby Township (MFS), Millinocket (CNC), Mount Desert (PROC), Ogunquit (RENC), Princeton (MFS).

***Amara rubrica* Haldeman (Plate 8)**

Habitat: Gravel pits and gardens, less restricted to sandy areas than *A. musculus*.

Flight dynamics: Fully winged, common at light traps, a frequent flier.

Biology: At least partly diurnal, found on goldenrod flowers.

General range: An eastern species. Northeast to Nova Scotia and New Brunswick, in Québec north to Québec City, in southern Ontario north to Bobcaygeon, west to South Dakota, and Kansas, Iowa, Ohio, Pennsylvania, and Maryland. Also south in the mountains to North Carolina.

Maine localities (5): Baldwin (CNC), Mount Vernon (MFS), Waterford (CNC), Weld (CNC), Wilton (CNC).

***Amara sinuosa* (Casey) (Plate 8)**

Habitat: According to Lindroth (1968), "... open, dry, sandy or gravelly ground, usually moraine [till], with sparse and low vegetation... On coastal tundra in N Newfoundland."; also found among leaves on old gravel forest roads in young regenerating forest areas.

Flight dynamics: Wings full, probably capable of flight.

Biology: Teneral adults appear from mid-June to early July.

General range: Transcontinental and northern. Northeast to Newfoundland and southern Labrador, in Québec, north to Schefferville, in Ontario, north to Cochrane, in the Northwest Territories, north to Yellowknife, in Yukon, north to Dawson; in Alaska only on the south coast, west to British Columbia and Vancouver Island; south to Colorado, Nebraska, northern Illinois and Indiana; in Ontario south to Parry Sound, in Québec south to Rigaud, isolated on Mt. Washington, New Hampshire.

Maine localities (3): East Millinocket (CNC), T3 R8 WELS (RENC), T4 R10 WELS (CNC).

***Amara torrida* (Panzer) (record from Dearborn and Donahue (1983))**

Habitat: Open, dry ground with moderately dense but primarily herbaceous vegetation and grasses, but sometimes shaded by low shrubs.

Flight dynamics: Fully winged, capable of flight; frequently found in wind-drift material but not known to be attracted to lights.

Biology: Found from April through October, egg-laying takes place from late June to mid-August; Teneral adults appear late June to August; overwinters at least in part as adults. Feeds on eggs of Lepidoptera.

General range: Holarctic; from Newfoundland and Labrador west to the Yukon Territory and Alaska in North America, south in the mountains to Colorado and New Hampshire.

Maine localities (1): Seboomook Plantation (location of specimen unknown; identified by Stuart Frost); there is no map in the plates since we have been unable to locate the actual specimen.

**Tribe Oodini**

**Genus *Oodes***

***Oodes amaroides* Dejean (Plate 37)**

Habitat: In emergent grasses along ponds and under dead leaves on wet mud; in southern Ontario, the species is rather common beneath tall cattails in marshes.

Flight dynamics: Fully winged, no flight records, but caught in drift material, e.g., on Lake Erie.

Biology: Unknown.

General range: An eastern and central North American species. Northeast to Maine, in southeastern New Hampshire, Massachusetts, and Connecticut, southern New York north to Rochester, in Ontario (Point Pelee), west to Michigan and Wisconsin, southwest to Illinois, south through Kansas, Oklahoma, and Texas to the Gulf Coast, thence eastward to Florida.

Maine localities (2): Acton (CNC), Lyman (RENC).

***Oodes fluvialis* LeConte (Plate 37)**

Habitat: Along muddy shores, in and near floodplain forests, in emergent mats of grasses or sedges and mosses.

Flight dynamics: Fully winged, no flight records.

Biology: An amphibious species, swims well, hides under water using end of abdomen above water surface to breathe.

General range: An eastern and central North American species. Northeast to Maine, in Québec north to Lanoraie near Sorel, in Ontario north to Ottawa and Gravenhurst, Michigan, Wisconsin, northwest to Duluth and Traverse Lake, Minnesota, west to Iowa, Missouri, south to the Sabine River, Louisiana, eastwards along the Gulf Coast to the southern tip of Florida.

Maine localities (8): Acton (CNC), Albany Township (CNC), Belgrade (RENC), Brighton Plantation (RENC), Monmouth (CNC), Mount Vernon (MFS), New Sharon (RENC), Troy (RENC).

## Genus *Lachnocrepis*

### *Lachnocrepis parallela* (Say) (Plate 33)

**Habitat:** On floating mats of water plants and emergent sedges, grasses, and cattails.

**Flight dynamics:** Fully winged, in light trap records.

**Biology:** Teneral adults appear in early June and late August. An amphibious species, this has been observed to remain underwater for up to 20 minutes. It breathes air by protruding the end of the abdomen above the water surface while the rest of the body remains submerged.

**General range:** An eastern and central species. Northeast to New Brunswick, in Québec east to Orford Lake, to Québec City and Montreal, in Ontario north to Ottawa, northwest to Winnipeg, Manitoba, west to the Dakotas, Nebraska, and Missouri, south to Alabama and Florida.

**Maine localities (11):** Acton (CNC), Albany Township (CNC), Auburn (CNC), Belgrade (RENC), Brighton Plantation (RENC), China (RENC), Monmouth (CNC), New Vineyard (RENC), Smithfield (RENC), Troy (RENC), Winslow (RENC).

## Tribe Panagaeini

### Genus *Panagaeus*

#### *Panagaeus fasciatus* Say (Plate 37)

**Habitat:** Sandy areas, northern specimens are either from shore drift or light traps.

**Flight dynamics:** Fully winged, a strong flier, light trap records.

**Biology:** Unknown.

**General range:** An eastern and central North American species. Northeast to southern Maine, otherwise known north to Connecticut and New York, in Ontario only in the drift on the Great Lakes, Michigan west to Iowa, Kansas, Oklahoma, south to Texas, the Gulf Coast, and Florida.

**Maine locality (1):** Portland (PVT).

## Tribe Chlaeniini

### Genus *Chlaenius*

#### *Chlaenius cordicollis* Kirby (Plate 23)

**Habitat:** In coarse gravel, occasionally among cobbles and in areas with small boulders adjacent to large rivers and lakes; readily flushed by splashing, usually in unshaded spots.

**Flight dynamics:** Fully winged, light trap records and flight observations.

**Biology:** Has been observed to escape by diving beneath the water's surface. Hibernates as adult. Adults active at night and easily found then.

**General range:** A northeastern species. Northeast to New Brunswick, in Québec on big rivers and lakes to Québec City, in Ontario north

to Ottawa, and Collingwood on Georgian Bay, in Manitoba north to Lake Winnipeg, west to North Dakota, Missouri, Arkansas, Illinois, Ohio, West Virginia, and Virginia.

**Maine localities (7):** Anson (CNC), Cornish (CNC, RPWC), Mercer (RENC), New Sharon (PVT, RENC), Norridgewock (RENC), Orono (MCZ), Skowhegan (RENC).

#### *Chlaenius emarginatus* Say (Plate 23)

**Habitat:** Moist areas in deciduous forests including floodplains and moist meadows near forests, under stones or logs.

**Flight dynamics:** Fully winged, in light trap records.

**Biology:** Teneral adults appear from late July through late October; long, scissor-like mandibles adapt it for large, soft prey such as caterpillars. It has been recorded eating gypsy moth caterpillars.

**General range:** An eastern and central North American species. Northeast to New Brunswick, in Québec along the St. Lawrence to Québec City, north to St. Jerome and Hull, in Ontario northwest to Rainy River, west to Minnesota, South Dakota, Kansas, and Oklahoma, south to Texas and the Gulf of Mexico, down the Florida Peninsula to Lake Worth.

**Maine localities (2):** Fryeburg (RPWC), Skowhegan (PVT).

#### *Chlaenius impunctifrons* Say (Plate 23)

**Habitat:** Flood plain forests on wet soil usually near water and river margins, also along the borders of marshes; has been taken from floating mats of sphagnum in a bog pool at 915 m elevation on Mt. Mansfield, Vermont.

**Flight dynamics:** Fully winged, no flight records.

**Biology:** Gravid females appear from mid-June to late July, teneral adults emerge in mid-August.

**General range:** An eastern and central North American species. Northeast to New Brunswick in Québec along the St. Lawrence River to northeast of Québec City, in Ontario north to Ottawa and Sioux Lookout, in Manitoba north to Lake Winnipeg, west to Minnesota, South Dakota, Wyoming, Colorado, southwest to Texas, south to Louisiana, Alabama, south in Florida to Lake Okeechobee.

**Maine localities (15):** Augusta (RENC), Fairfield (RENC), Farmington (PVT), Fryeburg (RPWC), Gilead (RENC), Kennebunk (MFS), Lewiston (MFS), Mechanic Falls (RENC), Mount Vernon (PVT), Norway (MCZ), Paris (MCZ), Scarborough (RENC), Waterboro (RPWC, RENC), Waterford (RENC), Waterville (RENC).

#### *Chlaenius laticollis* Say (Plate 23)

**Habitat:** In seasonally flooded forests, taken at the landward border of a salt marsh in Maine.

Flight dynamics: Fully winged, no flight observations.

Biology: Unknown.

General Range: An eastern-southern species.

Northeast to southern coastal Maine, and only near the coast in the New England states; inland populations extend north to New York, Pennsylvania, Ohio, southern Michigan, Illinois, Missouri, Kansas, Colorado, and Arizona; south to the Gulf Coast and Florida.

Maine locality (1): Phippsburg (RENC, MFS, UVM).

### ***Chlaenius lithophilus* Say (Plate 23)**

Habitat: Under cover on wet mud at borders of ponds and slow streams, including cattail marshes.

Flight dynamics: Fully winged, in light trap records.

Biology: Gravid females appear in late May, teneral adults emerge around mid-August.

General range: A nearly transcontinental species, not reaching the Pacific Coast. Northeast to Newfoundland, in Québec north to Lac St. Jean and Abitibi, in Ontario north to Ogoki and Nipigon, in Manitoba north to Lake Winnipeg, in the Northwest Territories, north to Port Smith, in eastern British Columbia, west to Ft. St. John, Golden and Creston, west to eastern Washington, Utah, southwestern Colorado, and New Mexico, south to Texas, Arkansas, reaching the Gulf of Mexico at Mobile, Alabama; also in northern Georgia and North Carolina.

Maine localities (12): Athens (RENC), Auburn (CNC), China (RENC), Fairfield (RENC), Grand Isle (CNC), Lewiston (MFS), Sidney (PVT, RENC), Squapan Township (CNC), T11 R12 WELS (MFS), T18 ED BPP (PVT), Vassalboro (PVT), Waterville (RENC).

### ***Chlaenius niger* Randall (Plate 23)**

Habitat: Among dense emergent vegetation in marshes, in the early spring on the land bordering summer habitats.

Flight dynamics: Fully winged, in light trap records.

Biology: Teneral adults in early August, a good natural swimmer, probably semi-amphibious.

General range: A northern and eastern species.

Northeast to Nova Scotia, New Brunswick, Newfoundland, and Labrador, in Québec north to Lac St. Jean and Abitibi, in Ontario north to Long Lac, in Manitoba north to Lake Winnipeg, in the Northwest Territories north to Ft. Smith, in British Columbia west to Okanagan, west to eastern Washington, south to Montana, Wyoming, Kansas, Arkansas, Texas, and the Gulf Coast east to Florida, down the Florida Peninsula to Miami.

Maine locality (1): Belgrade (PVT).

### ***Chlaenius pensylvanicus pensylvanicus* Say (Plate 23)**

Habitat: Common on muddy margins of ponds, pools, very slow streams, marshes, and fens, usually close to standing water rather than flowing water; along rivers, it lives along oxbows and isolated pools, beaver ponds are a characteristic habitat. It occurs by pools on the highest mountains of Vermont.

Flight dynamics: Fully winged, in light trap records.

Biology: Gravid females appear from May to mid-June, teneral adults emerge from mid-July to early September. It has been observed climbing trees up to two meters. Adults are nocturnal.

General range: A transcontinental species. Northeast to Newfoundland, in Québec north to Lac St. Jean and Abitibi, in Ontario north to Sudbury and Michipicoten River, in the southern prairie provinces north to the 51<sup>st</sup> parallel, in British Columbia, west to Kamloops and Vancouver Island, in Washington and Oregon west to the coast range, south to Idaho, Colorado, Kansas, central Arkansas, south to the Gulf Coast from Mississippi eastward, including the entire Florida Peninsula. Another subspecies, *Chlaenius pensylvanicus blanditus* Casey, is found in Utah, Arizona, New Mexico and Texas.

Maine localities (29): Bancroft (CNC), Bar Harbor (UVM), Bethel (MCZ), Bigelow Township (UVM), Brighton Plantation (RENC), Brunswick (MFS), Chain of Ponds Township (CNC), China (RENC), Eustis (CNC), Fort Kent (UVM), Garfield Plantation (MFS), Grand Isle (CNC), Houlton (UNH), Islesboro (PVT), Lebanon (UNH), Lewiston (MFS), Mercer (RENC), Monmouth (MCZ), Mount Vernon (MFS, RENC), Naples (CNC), Norridgewock (RENC), Oakfield (RPWC), Sidney (RENC), Cross Lake Township (MFS), T9 R18 WELS (UNH), Waterboro (RENC), Waterville (RENC), Winthrop (MCZ).

### ***Chlaenius sericeus sericeus* (Förster) (Plate 24)**

Habitat: Usually found near water on shores of lakes, ponds, rivers, and larger, slower brooks, under stones and among vegetation; common in bottomland forests and even by isolated pools and puddles. In wet weather, it can be found in roadside ditches, fields, and pastures. Has been taken in beaver lodges and amid the roots of goldenrod.

Flight dynamics: Fully winged, frequent at light traps. Adults are nocturnal.

Biology: Gravid females appear from mid-June to early August, teneral adults emerge from early August to mid-November. Like other *Chlaenius*, it emits a strong odor resembling creosote when handled. It has been observed climbing trees up to two meters above ground.

**General range:** A transcontinental species, but not occurring in the Southwest; two other subspecies (*Chlaenius sericeus regularis* LeConte and *Chlaenius sericeus sierricola* Casey) are found in California, Arizona, and northern Mexico. Northeast to Newfoundland, in Québec north to Lac St. Jean and Abitibi, in Ontario north to Hudson Bay, in the prairie provinces only in the extreme south; north to Lethbridge, Alberta, in British Columbia in the Okanogan Valley, in eastern Washington and Oregon south to northern California, Nevada, northern Arizona, New Mexico and central Texas, south to the Gulf of Mexico from Louisiana to Florida, including the entire peninsula.

**Maine localities (56):** Abbot (RENC), Auburn (CNC), Batchelders Grant Township (UVM), Berwick (CNC), Bethel (MCZ), Bigelow Township (UVM), Bridgton (MFS), Buckfield (RENC), Caratunk (RENC), Carrabassett Valley (RENC), Clinton (RENC), East Millinocket (CNC), Elliottsville Township (MFS), Embden (RPWC), Fairfield (PVT, RENC), Fryeburg (CNC, RPWC), Harrington (UVM), Jim Pond Township (RENC), Lebanon (CNC), Lewiston (MFS), Litchfield (CNC), Madrid Township (CNC), Matinicus Isle Plantation (MFS), Meddybemps (MFS), Mercer (RENC), Monmouth (CNC), Montville (RENC), Mount Vernon (MFS, RENC), Nesourdnahunk Township (CNC), New Gloucester (PVT), New Sharon (RENC), Norway (MCZ), Orono (MFS), Oxbow Plantation (MFS), Palmyra (RENC), Pittsfield (RENC), Readfield (CNC), Reed Plantation (CNC), Sabattus (RENC), Saco (MCZ), Sanford (CNC), Sidney (RENC), Skowhegan (RENC), South Berwick (MFS), Steuben (UVM), Strong (RENC), T14 R15 WELS (CNC), T15 R13 WELS (CNC), T19 ED BPP (MFS), T2 R9 WELS (RENC), T4 R10 WELS (CNC), T8 R14 WELS (PVT), Vienna (RENC), Waterboro (RENC), Waterville (RENC), Whitefield (RENC).

***Chlaenius tomentosus tomentosus* (Say) (Plate 24)**

**Habitat:** A xerophilous species, found in gravel pits, thinly vegetated gravelly slopes in pastures, and in cut over areas, sometimes found under big stones and also drift along lakeshores.

**Flight dynamics:** Fully winged, in light trap records.

**Biology:** Gravid females appear in early June.

**General range:** An eastern and central North American species. Northeast to Maine, in Québec along the St. Lawrence to Québec City area but not recorded from eastern townships, north to Nominigüe near Mt. Tremblant, in Ontario north to the Bruce Peninsula, in the prairies north to Lake Winnipeg, Manitoba, in Alberta north to Medicine Hat, west to North

Dakota and Colorado where it is present in the eastern foothills of the Rockies, southwest to Austin, Texas, south to the Gulf of Mexico to Louisiana and eastward but not in the Florida Peninsula.

**Maine localities (6):** Fryeburg (RPWC), Litchfield (PVT), Mechanic Falls (RENC), New Gloucester (PVT), Paris (UCD), Phippsburg (RENC).

***Chlaenius tricolor tricolor* Dejean (Plate 24)**

**Habitat:** Floodplain forests and usually near flowing waters, often under driftwood and stones along shores; in wet weather, can be some distance from shores, sometimes in fields, pastures, and gardens; at all elevations; has been taken on the summit of Mt. Washington, New Hampshire.

**Flight dynamics:** Fully winged, in light trap records.

**Biology:** Gravid females appear in early June, teneral adults emerge from mid-July to mid-August; has been observed climbing trees and in beaver lodges.

**General range:** An eastern and central North American species. Northeast to Newfoundland, in Québec north to Kamouraska and Charlevoix Counties, north of Montreal to Nominigüe and Fort Coulonge, in Ontario north to Collingwood on Georgian Bay, northwest to Saskatchewan, west to Montana and Colorado, south to Texas (near Brownsville on the Mexican border), Louisiana, Alabama, and Georgia. The subspecies *Chlaenius tricolor vigilans* Say is found in the Rocky Mountain portions of Alberta and British Columbia, south to Washington, Utah, and Nevada, as well as Arizona and California.

**Maine localities (24):** Anson (RENC), Bethel (MCZ), Carrying Place Township (MFS), East Millinocket (CNC), Embden (RPWC), Fairfield (PVT, RENC), Fryeburg (PVT, RPWC), Kennebunk (PVT), Lebanon (UNH), Lewiston (MFS), Manchester (PVT), Mercer (RENC), Mexico (CNC), Mount Vernon (MFS), Norridgewock (RENC), Orono (MCZ, MFS), Pleasant Ridge Plantation (MFS), Sabattus (RENC), Sidney (RENC), TA R7 WELS (MFS), Troy (RENC), Vassalboro (PVT), Waterville (PVT, RENC), Whitefield (RENC).

**Supertribe Harpalitae**

**Tribe Licinini**

**Genus *Diplocheila***

***Diplocheila assimilis* (LeConte) (Plate 27)**

**Habitat:** Seasonally flooded forests along large lakes and rivers.

**Flight dynamics:** Fully winged, no flight records.

**Biology:** Unknown. It probably eats small snails as other members of the genus.

General range: East to Massachusetts and southern New Hampshire to New Brunswick, north to northwestern Vermont, southwestern Québec, northwest to Minnesota, west to South Dakota, south to Iowa, Indiana, Maryland, and New Jersey, possibly Georgia.

Maine localities (2): Durham (RPWC), Mount Vernon (RPWC).

***Diplocheila impressicollis* (Dejean) (Plate 27)**

Habitat: Cattail and other types of marshes.

Flight dynamics: Fully winged, in light trap records.

Biology: Teneral adults may be found early May and late August.

General range: An eastern and central North American species. East to Maine, in Québec north to Portneuf and St. Jerome, in Ontario north to Ottawa, north to northern Michigan, Minnesota, and southern Manitoba, west to North Dakota, Nebraska, Kansas, and New Mexico, south to central Texas, Missouri, Illinois, Ohio, and Virginia.

Maine localities (3): Belgrade (RENC), New Gloucester (PVT), Troy (RENC).

***Diplocheila obtusa* (LeConte) (Plate 28)**

Habitat: An upland species of dry fields, roadsides, pastures and dry lawns, has been collected on short grass plains of Colorado.

Flight dynamics: Fully winged, in light trap records.

Biology: Hibernates as adult.

General range: A transcontinental species. Northeast to Nova Scotia and New Brunswick, in Québec north to Charlevoix-est and Lake Mistassini, in Ontario to Nipigon, in the Northwest Territories to Ft. Wrigley (beyond 63° N), west to Vernon, British Columbia, and eastern Washington, south to Idaho and Montana, isolated in Colorado and New Mexico, south to Kansas, Arkansas, Illinois, Ohio, Pennsylvania, and New Jersey.

Maine localities (2): Hancock (CNC), Lewiston (MFS).

**Genus *Dicaelus***

***Dicaelus dilatatus dilatatus* Say (Plate 27)**

Habitat: Open fields and along stream margins, one specimen in a sandy area in Vermont.

Flight dynamics: Vestigially winged.

Biology: Like all Licinini, thought to be a snail predator.

General range: An eastern-southern subspecies, east and south of the Appalachians. East to Maine, south to Connecticut, New Jersey, Virginia, the Carolinas, Georgia, and Florida, west to Alabama, Mississippi, and Arkansas. Another subspecies, *Dicaelus dilatatus sinuatus*

Ball, occurs from Pennsylvania west to Iowa and south to Tennessee and North Carolina.

Maine localities (2): Bangor (CNC), Kittery (MFS).

***Dicaelus elongatus Bonelli* (Plate 27)**

Habitat: Fields, gardens, and forest edges.

Flight dynamics: Vestigially winged.

Biology: Unknown.

General range: An east-central species. East to western Maine, north to the Champlain Valley of Vermont; in New York, southern Ontario, southern Michigan, Iowa, northwest to South Dakota, west to Nebraska, Kansas, Oklahoma, southwest to Texas, Louisiana, and the Gulf of Mexico, south in Florida to Miami.

Maine locality (1): Lewiston (MFS).

***Dicaelus politus* Dejean (Plate 27)**

Habitat: In deciduous forests, under rotten logs and loose bark in humid places.

Flight dynamics: Vestigially winged.

Biology: Teneral adults in fall to early November.

General range: An east-central species. East to central Maine, in Québec north to latitude of Montreal, in Ontario north to Belleville, north to Michigan and Wisconsin, west to Iowa and Missouri, south to Tennessee and Mississippi, south in the mountains to Alabama, Georgia, and North Carolina, in lowlands south to Maryland.

Maine localities (6): Alfred (RENC), Auburn (RPWC), Belgrade (RENC), Leeds (RENC), Mount Vernon (MFS), Turner (RENC).

**Genus *Badister***

***Badister grandiceps* Casey (Plate 11)**

Habitat: Floodplain forests, marshes and fens at water's edge; adults often among moist leaves.

Flight dynamics: Fully winged, recorded at lights.

Biology: Unknown.

General range: Northern transcontinental. Northeast to Cape Breton Island, Nova Scotia and New Brunswick, in Québec north to Lac St. Jean, in Ontario north to the Ottawa Valley, in Manitoba north to Lake Winnipeg, in Alberta, 161 km north of Edmonton, in British Columbia north to Vernon and west to Vancouver Island; in the USA, west to Washington and Oregon, south to Utah, Nebraska, Kentucky, and New Jersey.

Maine localities (4): Athens (RENC), Hartland (RENC), Jefferson (RENC), Newport (RENC).

***Badister micans* Leconte (record from Majka et al. (2011) as *Badister ocularis* Casey) (Plate 11)**

Habitat: Shady, wet margins of lakes, ponds, marshes and swampy areas with fine-grained

or organic substrates; found associated with *B. grandiceps* in southern Ontario (Lindroth 1966).

Flight dynamics: Fully winged, found in wind-drift material and sometimes attracted to artificial lights.

Biology: Teneral adults appear in late summer or early fall, adults found from March through October, undoubtedly overwintering at least in part as adults.

General range: Generally east of the Mississippi drainage, from Nova Scotia west through Québec to Illinois, south to Virginia and Georgia.

Maine localities (1): South Berwick (MFS).

***Badister neopulchellus* Lindroth (Plate 11)**

Habitat: Marshes, fens, standing waters, among cattails or sedge tussocks, in wet spots among dense plant growth.

Flight dynamics: Fully winged, frequent flier, abundant in light traps.

Biology: Feeds on mollusks like other members of the Licinini.

General range: Transcontinental. Northeast to Cape Breton Island, Nova Scotia and New Brunswick, in Québec north to Kamouraska, and to Hull, in Ontario north to Parry Sound, in Manitoba north to the southern end of Lake Manitoba, in the Northwest Territories north to Great Slave Lake, west in British Columbia to Vancouver; in the USA, west to Washington, Oregon, and California, south to Utah, Colorado, Texas, Missouri, and Georgia.

Maine localities (15): Ashland (UNH), Belgrade (PVT), Bridgton (MFS), Corinna (RENC), Durham (RPWC), Eustis (MFS), Fairfield (RENC), Gardiner (UNH), Lebanon (UNH), Lewiston (MFS), Mount Vernon (MFS), Newport (RENC), Tim Pond Township (MFS), Topsfield (MFS), Winslow (PVT).

***Badister notatus* Haldeman (Plate 11)**

Habitat: Largely an open grassland species; pastures, gardens, and in leaf litter on floodplains in Virginia.

Flight dynamics: Wings dimorphic, fully winged form rare, flight not recorded.

Biology: Probably feeds on mollusks.

General range: An eastern species. East to southwestern New Brunswick, southern New Hampshire, southern and western Vermont, in Québec near Montreal, in Ontario north to Ottawa, northwest to Michigan and Minnesota, west to South Dakota, Kansas, and Texas, south to Mississippi and Georgia.

Maine localities (3): Lewiston (MFS), Salem Township (UNH), Waterville (RENC).

***Badister obtusus* LeConte (Plate 11)**

Habitat: In deciduous forests under damp leaves.

Flight dynamics: Fully winged, flight records.

Biology: Unknown.

General range: East to New Brunswick, Nova Scotia, and Anticosti Island, north in Québec to Abitibi south to Montreal area, in western Canada north to the Northwest Territories, west to Alberta, south in Rockies to New Mexico, in the Great Plains, south to North Dakota, Minnesota, northern Michigan, not previously known from New England.

Maine localities (2): Islesboro (PVT), Waterville (PVT).

***Badister transversus* Casey (Plate 11)**

Habitat: Swamps and marshes with cattails.

Flight dynamics: Fully winged, taken at light traps.

Biology: Probable snail feeder.

General range: An eastern species, in a narrow strip of territory in the latitude of the Great Lakes. East to New Brunswick, in Québec, Montreal area and south, in Ontario north to Ottawa and Thunder Bay, west to the southeastern corner of Manitoba and to South Dakota, south to northern Indiana and northern New Jersey.

Maine localities (5): Athens (RENC), Mt. Vernon (MFS), Newport (RENC), Smithfield (RENC), Waterville (RENC).

**Tribe Harpalini**

**Subtribe Anisodactylina**

**Genus *Notiobia***

***Notiobia nitidipennis* (LeConte) (state records only from Bousquet and Laroche (1993) and Bousquet (2010))**

Habitat: Moist sandy or gravelly soils in open deciduous forests or grassy meadows.

Flight dynamics: Fully winged; often found in lake-shore wind-drift materials, commonly attracted to artificial lights at night.

Biology: Teneral adults generally appear as early as mid-June, but generally in late summer through the fall; overwinter as adults. Egg-laying seasonality unknown but probably occurs in spring to early summer.

General range: In the East, from Florida west to Texas, north to Wisconsin and Michigan, and east to Québec and southwestern Maine.

Maine localities: No specific Maine localities known.

***Notiobia terminata* (Say) (Plate 36)**

Habitat: Dry, open, sandy ground with sparse vegetation, gravel pits, cultivated land, and disturbed weedy grounds in general.

Flight dynamics: Fully winged, a frequent flier, common at light traps.

Biology: Teneral adults appear in mid-June to early July, mating takes place in August. Largely a plant-feeder, favors ripe seeds but will eat immature seeds or grass blades; recorded from bluegrass, milo, and seeds of fireweed.

General range: An eastern and central North American species, found southwards into Central America. Northeast to Nova Scotia and New Brunswick, in Québec north to south side of Gaspé and to Abitibi, in Ontario north to Sudbury and Michipicoten River, in Michigan north to Lake Superior, west to the Dakotas, and Nebraska, Oklahoma, Texas, and southeastern Arizona, south to the Gulf of Mexico including the Florida Peninsula, south through Mexico, Guatemala, Costa Rica, and extreme western Panama.

Maine localities (9): Albany Township (CNC), Brunswick (MFS), Eustis (MFS), Fryeburg (CNC), Mount Vernon (MFS), Steuben (UVM), T3 R11 WELS (MFS), Turner (RENC), Waterville (RENC).

### Genus *Xestonotus*

#### *Xestonotus lugubris* (Dejean) (Plate 46)

Habitat: In open forests and forest edges, on waste ground or roadsides.

Flight dynamics: Fully winged, in light trap records.

Biology: Teneral adults appear in April to mid-May and again from mid-August to September, gravid females may be encountered from late May to mid-June; has been taken in a beaver lodge.

General range: An east-central species. Northeast to Nova Scotia and New Brunswick, in Québec north to Port-au-Saumon, Mont Laurier, and Ft. Coulonge, in Ontario north to Nipigon, north to Michigan, Minnesota, west to South Dakota, Iowa, Missouri, and Arkansas, south to Illinois, Ohio, West Virginia, and North Carolina.

Maine localities (5): Bethel (UVM), Fairfield (RENC), Mount Vernon (MFS), Waterville (RENC), Wyman Township (UVM).

### Genus *Anisodactylus*

#### *Anisodactylus agricola* (Say) (Plate 9)

Habitat: Deciduous forests, leaf litter.

Flight dynamics: Fully winged, though small. No flight records.

Biology: Unknown.

General range: An eastern species. Northeast to southern Maine (Wells), coast of New Hampshire and Massachusetts, southern New

York, Pennsylvania, Ohio, Michigan, north to Mackinac, southwestern Ontario near Windsor and Fort Erie, (an isolated record at Montreal, Québec), northwest to Minnesota, west to Nebraska, Kansas, south to Iowa, Alabama, and South Carolina.

Maine localities (1): Wells (PVT).

#### *Anisodactylus discoideus* Dejean (Plate 9)

Habitat: Along medium to large rivers or lakes on deposits of sand or sandy mud.

Flight dynamics: Fully winged, an occasional flier, caught at light traps.

Biology: Commonly found under driftwood, sometimes numerous in crevices and river deposits. A burrower. Sometimes partly diurnal, eggs laid from early June to late July.

General range: An eastern species. East to New Brunswick, in Québec in the St. Lawrence Valley north to Mt. Tremblant (village), in Ontario north to Ottawa and Bayfield on Lake Huron, in Manitoba north to Winnipeg and west to southern Saskatchewan and Nebraska, south to Missouri, Kentucky, and Georgia.

Maine localities (6): Auburn (CNC), Mt. Vernon (MFS), Norridgewock (RENC), Sidney (PVT, RENC), Washington (RENC), Waterville (RENC).

#### *Anisodactylus harrisii* LeConte (Plate 9)

Habitat: Most specimens caught near lakes, rivers, brooks, or ponds (including marshy pools in abandoned gravel pits), but also on moist to wet ground in gardens and mountain pastures.

Flight dynamics: Fully winged, has been taken in light traps.

Biology: Gravid females appear in early May to mid-June, teneral adults from 1 April through mid-June, also early August to early November. This species has been observed eating grass seeds.

General range: Transcontinental species. Northeast to Nova Scotia and New Brunswick, in Québec north to Abitibi, in Ontario north to Parry Sound, north to Winnipeg, Manitoba, Prince Albert, Saskatchewan and to Red Deer, Alberta; in British Columbia, west to Vancouver City, Puget Sound in Washington, south to Utah, Colorado, Iowa, Illinois, Ohio, and Maryland with a narrow extension down the Appalachians to southern Tennessee and North Carolina. Isolated records from western Oregon, southern California, southern Arizona, and central Mississippi.

Maine localities (25): Arrowsic (RENC), Athens (RENC), Auburn (CNC), Bar Harbor (UVM), Bethel (PVT), Carrabassett Valley (CNC), Clinton (RENC), East Millinocket (CNC), Fairfield (RENC), Fryeburg (RPWC), Lewiston (MFS),

Monhegan Island Plantation (PVT), Monmouth (PVT), Mount Vernon (MFS), New Sharon (RENC), Norridgewock (RENC), Orono (PVT), Sabattus (RENC), Sidney (RENC), T2 R9 WELS (RENC), Waterville (PVT, RENC), Wells (PVT), Winslow (RENC).

***Anisodactylus kirbyi* Lindroth (Plate 9)**

**Habitat:** In wet habitats near ponds and marshes.

Can be treaded from marsh plants, especially common in lakeside forests of Lake Champlain.

**Flight dynamics:** Fully winged, no flight records.

**Biology:** Beetles trampled from marshes dive to escape; a strong swimmer; swimming specimens collected in rivers. Gravid females appear from May to mid-June.

**General range:** Disjunct east-west range. East to the Magdalen Islands and Prince Edward Island in Canada, in Québec north to Lac St. Jean and Mt. Tremblant (village), in Ontario north to Sudbury and Thunder Bay; in Manitoba, northwest to vicinity of Winnipeg, west to Fargo, North Dakota, south to Minnesota, central Indiana, southern Pennsylvania, and New Jersey. In the West, from southern British Columbia west to Vancouver, south to Seattle, Washington and the Willamette Valley of Oregon, in California in both San Francisco and Los Angeles, in notheastern Idaho, but not east of the Rockies.

**Maine localities (21):** Athens (RENC), Auburn (PVT, RENC), Belgrade (RENC), Bethel (PVT), Bigelow Township (UVM), Cape Elizabeth (PVT), Clinton (RENC), Durham (RPWC), Fryeburg (RPWC), Jefferson (RENC), Litchfield (CNC), Millinocket (CNC), Monmouth (CNC, PVT), Mount Katahdin Township (PVT), Ogunquit (CNC), Orono (MFS), Orrington (MFS), Paris (PVT), Wales (PVT), Waterville (RENC), Wells (PVT).

***Anisodactylus laetus* Dejean (Plate 9)**

**Habitat:** Unknown. Phippsburg specimen taken beneath driftwood in a backbeach dune area.

**Flight dynamics:** In light trap records.

**Biology:** Unknown.

**General range:** An eastern species. Northeast to southern Maine, north to Ontario, Michigan, west to Minnesota, Kansas, Texas, south to Louisiana, Florida, east to the Atlantic. Closest record to Maine is New York City.

**Maine localities (2):** Belgrade (RENC), Phippsburg (RENC).

***Anisodactylus merula* (Germar) (Plate 9)**

**Habitat:** Dry, sandy ground with sparse vegetation, sand pits, pastures, lowbush blueberry fields, and waste ground.

**Flight dynamics:** At least some specimens fully winged, taken at lights.

**Biology:** Teneral appear in mid-April to 30 July and in the fall until 19 October. Gravid females have been documented in early July.

**General range:** An east-central species. Northeast to Maine, in Québec to Trois Riviere, in Ontario north to Ottawa and southern Manitoba, in central Minnesota, west to Nebraska, Colorado and Arizona, south to Alabama and Florida.

**Maine localities (14):** Albany Township (CNC), Augusta (RENC), Belgrade (RENC), Columbia Falls (CNC, RENC), Fairfield (RENC), Fryeburg (RPWC), Hiram (CNC), Lewiston (MFS), Mechanic Falls (RENC), Moscow (PVT), Shapleigh (RPWC), Washington (RENC), Waterville (RENC), York (PVT).

***Anisodactylus nigerrimus* (Dejean) (Plate 9)**

**Habitat:** Dry uplands, gravel pits, eroded glacial outwash, sand dunes, and coastal sand areas. Recorded from several high mountains in New England.

**Flight dynamics:** Fully winged, not recorded from lights.

**Biology:** Gravid females occur from early May to mid-June. Teneral adults appear in both the spring and fall.

**General range:** An east-central species. Northeast to Newfoundland (though possibly not established), Nova Scotia, New Brunswick, in Québec along the St. Lawrence to Grandes Bergereones, (nowhere away from the St. Lawrence or Ottawa Rivers), in Ontario northwest to Sioux Lookout, isolated records far beyond this in southwestern Saskatchewan and southeastern Alberta, west to Minnesota, Iowa, eastern Kansas, northwestern Louisiana, south to Mobile, Alabama, and Beaufort, South Carolina.

**Maine localities (18):** Bar Harbor (UVM), Berwick (CNC), Boothbay (PVT), Brewer (PVT), Carrabassett Valley (CNC), Fairfield (RENC), Hartland (RENC), Kennebunk (MFS), Leeds (RENC), Mount Vernon (MFS), Naples (CNC), Newport (PVT), Norridgewock (RENC), Paris (PVT), Phippsburg (RENC), T1 R9 WELS (RPWC), T14 R11 WELS (RPWC), T2 R9 WELS (RENC).

***Anisodactylus nigrita* Dejean (Plate 10)**

**Habitat:** Wet soil. In Vermont, has been taken by small temporary ponds and grassy, marshy shores; sometimes taken by treading, also by beaver ponds and lodges.

**Flight dynamics:** Fully winged, has been taken at malaise and light traps.

**Biology:** Teneral adults appear in both spring and fall.

**General range:** Transcontinental. Northeast to Nova Scotia and New Brunswick, in Québec north to Lac St. Jean and Abitibi, in Ontario north to Lake Superior, in Manitoba north to Lake Winnipeg, in Saskatchewan north to Prince Albert, in southern Alberta, Lethbridge and Medicine Hat, in southern British Columbia, north to Vernon; in Washington, west to Seattle, south to Columbia River, otherwise in the USA occurs west only to North Dakota, western Nebraska, and Denver, Colorado; south to Iowa, Illinois, Kentucky, Tennessee, western North Carolina, and Maryland.

**Maine localities (17):** Albany Township (CNC), Auburn (RENC), Bangor (PVT), Bar Harbor (UVM), Belgrade (RENC), Bethel (PVT), Clinton (RENC), Corinna (RENC), East Millinocket (CNC), Fairfield (RENC), Litchfield (CNC), Millinocket (CNC), Monmouth (PVT), Mount Vernon (MFS, RENC), Oakfield (RPWC), Saco (PVT), Waterville (RENC).

***Anisodactylus rusticus* (Say) (Plate 10)**

**Habitat:** Dry, sandy, gravelly soil, dune sand, frequent in gravel pits, in dry sandy gardens; has been taken under goldenrod roots and plant rosettes.

**Flight dynamics:** Fully winged, light trap records, probably a frequent flier.

**Biology:** Teneral adults appear in both spring and fall.

**General range:** An east-central species. Northeast to Nova Scotia and New Brunswick, in Québec north to the St. Lawrence River and Mt. Tremblant village, in Ontario north to Ottawa and to Grand Bend on Lake Huron, north to Winnipeg, Manitoba, west to Yellowstone Park, Wyoming, as well as Colorado and Arizona, south to south-central Texas, Louisiana, and Florida.

**Maine localities (19):** Albany Township (CNC), Alfred (RPWC), Augusta (RENC), Bar Harbor (UVM), Bigelow Township (UVM), Columbia Falls (CNC), Fryeburg (RPWC), Hiram (CNC), Magalloway Plantation (RPWC), Mechanic Falls (RENC), Mount Vernon (RENC), Naples (CNC), Newfield (CNC), Parsonsfield (CNC), Sabattus (RENC), Washington (RENC), Waterville (RENC), Windsor (RENC), York (RPWC).

***Anisodactylus sanctaecrucis* (F.) (Plate 10)**

**Habitat:** A generally hygrophilous species found on shores of rivers and lakes, also found along small streams and in wet weather, on disturbed soil of gardens or elsewhere well-removed from water. Adults usually occur under debris, logs, and sticks.

**Flight dynamics:** Fully winged and a frequent flier, has been taken at light traps; probable stray fliers have been taken on mountain tops.

**Biology:** Teneral adults appear from June into October; the species flies by day in spring.

**General range:** Transcontinental. Northeast to Nova Scotia and New Brunswick, in Québec north to Québec City and Maniwaki, in Ontario north to Cochrane and the north shore of Lake Superior, west to the extreme south of Saskatchewan and Alberta, in British Columbia northwest to Kamloops, but not reaching the coast, south to Oregon, Utah, Colorado, Kansas, Louisiana, Alabama, and Georgia.

**Maine localities (34):** Abbot (RENC), Albany Township (CNC), Andover (CNC), Anson (CNC), Auburn (CNC), Bar Harbor (PROC, UVM), Belgrade (RENC), Carrabassett Valley (CNC, RENC), Charleston (RENC), Clinton (RENC), Columbia Falls (MFS, RENC), Eustis (CNC), Fairfield (RENC), Fryeburg (MFS), Garfield Plantation (MFS), Kibby Township (MFS), Lebanon (CNC), Litchfield (CNC), Macwahoc Plantation (MFS), Mechanic Falls (RENC), Millinocket (CNC), Molunkus Township (MFS), Monmouth (CNC), Mount Vernon (MFS), Norridgewock (RENC), Ogunquit (CNC, RENC), Orono (MFS), Sidney (RENC), Soper Mountain Township (MFS), Turner (RENC), Unity (RENC), Waterford (RENC), Waterville (RENC), York (PVT).

***Anisodactylus verticalis* (LeConte) (Plate 10)**

**Habitat:** In floodplain forests, usually in heavily shaded areas along rivers, lakes, and large brooks, often under debris and logs on sandy soils.

**Flight dynamics:** Fully winged, seen flying to lights.

**Biology:** Teneral adults emerge from late May into September

**General range:** An eastern species. Northeast to New Brunswick, in Québec, from the Montreal area down the St. Lawrence River to Québec City, in Ontario north to Ottawa and Toronto, northwest to southern Saskatchewan, west to South Dakota and Kansas, southwest to Oklahoma, south to Arkansas, Kentucky, and South Carolina.

**Maine localities (1):** Paris (CNC).

**Genus *Geopinus***

***Geopinus incrassatus* (Dejean) (Plate 31)**

**Habitat:** In sand or very sandy soil, especially in the higher, drier parts of riverside or lakeside sand banks.

**Flight dynamics:** Fully winged, light trap records.

**Biology:** A specialized burrower, spending the day deeply buried in sand, runs actively on surface at night, found in the dry parts of sand banks, in contrast to *Omophron*, *Dyschirius*, and *Clivina* which are usually found in wet sand.

**General range:** A widespread species not reaching the Pacific Coast. Northeast to southern Maine, north to central New Hampshire at Plymouth, in Vermont known from the Lake Champlain Valley; in Québec, along the St. Lawrence River to Berthierville, in Ontario north to Ottawa and Michipicoten River, in Manitoba north to Lake Manitoba, northwest to southern Alberta, west to Idaho, Nevada, Arizona, south to New Mexico, Texas, Louisiana and Georgia, (not known from Florida).

**Maine locality (1):** Phippsburg (RENC).

### Genus *Amphasia*

#### *Amphasia interstitialis* (Say) (Plate 9)

**Habitat:** In deciduous forests, also in the open near brooks, especially common in towns where it is often found under large bushes in summer, probably common among tall weeds and grasses.

**Flight dynamics:** Fully winged, flight wings black; very common at summer light traps, a frequent flier.

**Biology:** Hibernates as adult.

**General range:** An eastern species. Northeast to Maine, in Québec, north to Québec City, in Ontario north to Ottawa and Grand Bend on Lake Huron, northwest to Minnesota, west to South Dakota and Kansas, southwest to Arkansas, south to Tennessee and Virginia.

**Maine localities (5):** Gorham (PVT), Lewiston (MFS), Mt. Vernon (MFS), Pownal (PVT), Waterville (RENC).

#### *Amphasia sericea* (Harris) (Plate 9)

**Habitat:** Sandy areas and waste ground, frequent among dense grasses and herbs.

**Flight dynamics:** Fully winged, less common at light traps than *A. interstitialis*.

**Biology:** Unknown.

**General range:** An eastern species. Northeast to New Brunswick, an isolated record from the Magdalen Islands; in Québec, seemingly confined to the valley of the St. Lawrence to Port-au-Saumon, in Ontario north to Marmora, Barrie and Grand Bend, west through Minnesota to South Dakota, southwest to Kansas and Texas, south to Louisiana and Florida.

**Maine localities (3):** Brunswick (MFS), Kittery (CNC), Mount Vernon (MFS).

### Subtribe *Stenolophina*

#### Genus *Dicheirotrichus*

#### *Dicheirotrichus cognatus* (Gyllenhal) (Plate 27)

**Habitat:** Under cover in dry, open areas; in New England, on barren summits of mountains or abandoned pastures, sand pits, roadsides, and open till areas; also on the seacoast.

**Flight dynamics:** Fully winged, in light trap records.

**Biology:** Teneral adults appear from July to early August; has been taken at a beaver lodge and in Alberta in a clear-cut forest.

**General range:** A Holarctic species. In the Old World, from the British Isles to Scandinavia, northern Russia, and across northern Siberia; isolated in the Alps and Bohemia, Iceland, and Greenland. In the New World, a transcontinental species. Northeast to Newfoundland and Labrador, in Québec north to Schefferville and Great Whale River, in Ontario north to Nipigon and Ogoki, in Manitoba north to Gillam on the Nelson River, in the Northwest Territories north to Norman Wells and Ft. Good Hope, in the Yukon north to Rampart House on the Porcupine River, in Alaska north to Arctic Circle, west nearly to the mouth of the Yukon River, west to Attu in the Aleutian Islands, south to Kodiak Island; in British Columbia, west to the Queen Charlotte Islands and Vancouver Island, south to the mountains of California, Arizona, and New Mexico, in the Black Hills of South Dakota, otherwise not south of 49<sup>th</sup> parallel on the Great Plains; in the east, south to Michigan and northern Indiana, Pennsylvania, New York, and in the mountains of Massachusetts, Vermont, and New Hampshire; also recorded from the seacoast in New Hampshire and Maine.

**Maine localities (14):** Augusta (UNH), Bar Harbor (PROC, UVM), Calais (MFS), Carrabassett Valley (PVT), Georgetown (UVM), Moro Plantation (CNC), Mount Desert (PROC, UVM), Mount Katahdin Township (CNC, RENC), Saint Francis (UNH), Southwest Harbor (PROC), T11 R10 WELS (MFS), T14 R12 WELS (MFS), Cross Lake Township (UNH), Washburn (RENC).

### Genus *Bradycellus*

#### *Bradycellus atrimedeus* (Say) (Plate 20)

**Habitat:** Sandy mud along large and medium-sized rivers, lakes, ponds, and swamps.

**Flight dynamics:** Fully winged, in light trap records.

**Biology:** Hibernates as adult.

**General range:** A northeastern species. Northeast to New Brunswick, in Québec along the St. Lawrence River to Port-au-Saumon, northeast

of Québec City, in southern Ontario north of Toronto, north to Michigan and Wisconsin, west to South Dakota, Missouri, and Texas, south to Tennessee and North Carolina.

Maine locality (1): Waterville (RENC).

***Bradycellus badipennis* (Haldeman) (Plate 20)**

Habitat: Wooded swamps under dead leaves.

Flight dynamics: Fully winged, diurnal and light trap records.

Biology: Makes (diurnal) spring dispersal flight, probably from upland overwintering sites; gravid females appear in early May.

General range: An eastern species. Northeast to New Brunswick, in Québec northeast to Québec City region and west to Ottawa city region, northwest to Wisconsin, south to Missouri, Tennessee, and Georgia.

Maine localities (5): Canaan (RENC), Fairfield (RENC), Isle Au Haut (CNC), Mount Vernon (MFS), Oxbow Plantation (MFS).

***Bradycellus congener* (LeConte) (Plate 20)**

Habitat: Meadows, vacant land, sand pits, and borders of highways, generally on dryer fine-grained substrates.

Flight dynamics: Fully winged, a frequent flier; common at light traps.

Biology: Unknown.

General range: Very widespread in western states and Great Plains, with a narrow eastward extension in the latitude of the Great Lakes. Northeast to Maine, in Québec along the St. Lawrence River to the Saguenay and north to the Abitibi district, in Ontario north to Ottawa and Southampton on Lake Huron, in Manitoba north to Lake Winnipeg, in Saskatchewan north to Saskatoon, in Alberta to Edmonton, in British Columbia, northwest to the Peace River area, west to Vancouver. In the USA, west to the Pacific Coast, south to Arizona, New Mexico, and Texas, east to the Great Plains only along the northern edge of the USA, in Minnesota, Michigan, New York (West Point), and Massachusetts.

Maine localities (3): Rockwood Strip T1 R1 NBKP (UNH), Rockwood Strip T2 R1 NBKP (UNH), Cross Lake Township (UNH).

***Bradycellus kirbyi* (Horn) (Plate 20)**

Habitat: Riverside sedge marshes, beaver ponds, marshes, winters in upland localities.

Flight dynamics: Fully winged, in light trap records.

Biology: Hibernates as adult.

General range: A northeastern species at the latitude of the Great Lakes. Northeast to New Brunswick, in Québec only in the south and southwest, north to Sherbrooke and Joliette, in

southern Ontario north to the outlet of Lake Simcoe, west to Michigan, Wisconsin, south to Ohio, Pennsylvania and Virginia.

Maine locality (1): Winslow (RENC).

***Bradycellus lecontei* Csiki (Plate 20)**

Habitat: Wet spots with emergent grasses or sedges, at the borders of ponds and bogs.

Flight dynamics: Fully winged, light trap records.

Biology: Teneral adults appear in August.

General range: A northern transcontinental species.

NE to Newfoundland and Labrador, in Québec north to the North Shore and Lake Mistassini, in Ontario north to Hudson Bay, north to Ft. Smith, in the Northwest Territories and Dawson in the Yukon; in Alaska west to Fairbanks, in the interior of British Columbia, west to Washington and Oregon, south to Idaho, Montana, Colorado, South Dakota, Minnesota, northern Illinois, Michigan, southern Ontario, New York and Massachusetts.

Maine localities (8): Bar Harbor (PROC, UVM), Belgrade (RENC), Bigelow Township (UVM), Brighton Plantation (RENC), Eustis (CNC), Jefferson (RENC), Newport (RENC), T1 R13 WELS (UNH).

***Bradycellus lugubris* (LeConte) (Plate 20)**

Habitat: Deciduous woods under stones, alders, or other bushes and in heaps of grass; in New England, commonest in the mountains but not restricted there.

Flight dynamics: Fully winged, in light trap records.

Biology: Females gravid in early May, hibernates as adult.

General range: Northern and largely an eastern species. Northeast to Newfoundland, in Québec north to the North Shore and James Bay, in Ontario north to Sioux Lookout, in Alberta north of Edmonton at George Lake, south to Minnesota, northern Illinois, Ohio, Pennsylvania, New York, and Connecticut, south in the mountains through Virginia and West Virginia to Tennessee and North Carolina.

Maine localities (9): Athens (RENC), Canaan (RENC), Carrabasset Valley (PVT), Fairfield (RENC), Hancock (CNC), Kibby Township (MFS), Oakland (RENC), Sidney (RENC), Waterville (RENC).

***Bradycellus neglectus* (LeConte) (Plate 21)**

Habitat: On dry gravelly or sandy ground, including sand pits, and on mountain ledges and cliffs. In Vermont, it seems limited to the mountains.

Flight dynamics: Fully winged, multiple light trap records.

Biology: Winter aggregations of this species with *Bradycellus nigriceps* LeConte have been

reported; has been taken in beaver lodges; teneral adults have been observed in mid-August, hibernates as an adult.

**General range:** A northern and nearly transcontinental species. Northeast to Newfoundland, in Québec north to the North Shore and James Bay, in Alberta north to the Edmonton area, northwest to the Peace River region in the northeast portion of the province, south to Utah (not recorded elsewhere in the western states); east of the Rocky Mountains, south to South Dakota, northern Illinois and Ohio, New York, and Connecticut.

**Maine localities (15):** Bar Harbor (PROC, UVM), Belgrade (RENC), Bigelow Township (UVM), East Millinocket (CNC), Kibby Township (MFS), Lang Township (MFS), Milbridge (RENC), Moro Plantation (CNC), Mount Katahdin Township (RENC), Mount Vernon (RPWC), Naples (CNC), Pittston Academy Grant (RPWC), Portage Lake (MFS), T15 R13 WELS (CNC), T4 R10 WELS (CNC).

***Bradycellus nigriceps* LeConte (Plate 21)**

**Habitat:** Grassy borders of swamps and streams, except when overwintering in uplands.

**Flight dynamics:** Fully winged, frequent light trap records.

**Biology:** Makes a spring diurnal dispersal flight to summer habitat, in winter it hibernates in aggregations with *B. neglectus*.

**General range:** An eastern species. Northeast to New Brunswick, in Québec north to Québec City, and Mt. Tremblant, northwest to Manitoba, west to Minnesota, Iowa, and Arkansas, south to Mississippi and South Carolina.

**Maine localities (6):** Clinton (RENC), Jim Pond Township (RENC), Naples (CNC), Newport (CNC), Sidney (RENC), T4 R10 WELS (CNC).

***Bradycellus nigrinus* (Dejean) (Plate 21)**

**Habitat:** In marshes and marshy borders of streams with emergent sedges or grasses, especially abundant in beaver ponds, on borders of sphagnum bogs, and under dead plants in moist spots in the montane forests.

**Flight dynamics:** Fully winged, light trap records and observed in diurnal flights.

**Biology:** Gravid females appear in early July, teneral adults in late August; forms aggregations in upland hibernation sites, moves to summer habitat in diurnal spring dispersal flight.

**General range:** A northern transcontinental species. Northeast to Newfoundland, in Québec north to the North Shore and James Bay, in Alberta at least north to Edmonton, recorded from Alaska and to be expected from the Northwest Territories and Yukon; in British Columbia, west to

Vancouver Island and the Queen Charlotte Islands, west in the USA to Washington, Oregon, and California, south in the mountains to Utah and New Mexico, not recorded from the Great Plains of the USA; south to Minnesota, Illinois, Indiana, Ohio, Pennsylvania, West Virginia, Virginia, New York, and Connecticut.

**Maine localities (31):** Athens (RENC), Auburn (CNC), Bar Harbor (PROC, UVM), Belgrade (RENC), Brighton Plantation (RENC), Camden (CNC), Carrabassett Valley (PVT), China (CNC), Clinton (RENC), Edmunds Township (CNC), Fairfield (RENC), Grand Isle (CNC), Hancock (CNC), Jefferson (RENC), Kibby Township (MFS), Lang Township (MFS), Lebanon (UNH), Lewiston (MFS), Lily Bay Township (UVM), Mount Katahdin Township (PVT, RENC), New Canada (MFS), Northeast Carry TOWNSHIP (RPWC), Orono (MFS), Saint Agatha (MFS), Sidney (RENC), Skowhegan (RENC), T4 R10 WELS (CNC), T6 R11 WELS (UVM), Upton (CNC), West Forks Plantation (CNC), Winslow (RENC).

***Bradycellus rupestris* (Say) (Plate 21)**

**Habitat:** In dry, open situations at all elevations including the summit of Mt. Washington in New Hampshire; in gardens, on bare soil, among low weeds, roadsides, croplands, pastures, ledges, quarries, and gravel pits.

**Flight dynamics:** Fully winged, abundant at light traps, a frequent flier.

**Biology:** Teneral adults appear from August to November. Aggregates in winter in forests or sheltered areas. It makes a diurnal spring dispersal flight.

**General range:** An east-central species. Northeast to Cape Breton Island, Nova Scotia; in Québec north to Saguenay and Abitibi, in Ontario north to the Bruce Peninsula, north to Minnesota and South Dakota, west to Kansas and Oklahoma, south to Louisiana, Mississippi, Alabama, and Florida.

**Maine localities (11):** Albany Township (CNC), Augusta (UNH), Fairfield (RENC), Fryeburg (RPWC), Lewiston (MFS), Mount Vernon (MFS), Naples (CNC), Reed Plantation (CNC), Sidney (RENC), T17 R4 WELS (UNH), Waterville (RENC).

***Bradycellus semipubescens* Lindroth (Plate 21)**

**Habitat:** Marshy areas along beaver ponds, bogs, and oxbow pools along rivers.

**Flight dynamics:** Fully winged, in light trap records.

**Biology:** Gravid females appear in early June; species makes a diurnal spring dispersal flight.

**General range:** Poorly known. Northeast to New Brunswick, in Québec north to the North Shore

and James Bay, in Ontario north of Ottawa, recorded from Michigan, a distant record from Fort McMurray, Alberta, south to New York and Connecticut.

Maine localities (3): Bangor (CNC), Bethel (CNC), Merrill (MFS).

***Bradycellus tantillus* Dejean (record from Majka *et al.* (2011)) (Plate 21)**

Habitat: Open ground with wet, fine-grained soils covered by dense herbaceous vegetation, in marshes and at margins of eutrophic ponds and slow, small streams.

Flight dynamics: Fully winged; occasionally found in wind-drift material, but frequently attracted to artificial lights at night.

Biology: Teneral adults appear in late summer (July-August); overwinters as adults and may be found year-round.

General range: In the East, from southern Ontario west to South Dakota and Iowa, south to Texas and east to Florida; recorded from Vermont by Bousquet (2010).

Maine localities (1): Vassalboro (PVT).

**Genus *Stenolophus***

***Stenolophus comma* (F.) (Plate 44)**

Habitat: Bare, wet soil, agricultural land, river banks, lakeshores, and even by settling pools in inactive sand/gravel pits.

Flight dynamics: Fully winged, many light trap records, observed flying during day in spring.

Biology: A burrower in wet mud, but when the burrow dries out, it flies to another suitable place; can be a minor agricultural pest, occasionally attacking sprouting grain when the soil is wet; commonly burrows beneath drift material, and is heavily favored by human activity but its presence in archeological sites in Boston dating to before 1700 shows that it is an old inhabitant of the Northeast. Teneral adults appear from early August to September; larvae live 2–3 cm below surface and are reported to feed on microorganisms; adults can live up to three years in captivity.

General range: A transcontinental species. Northeast to Newfoundland, in Québec north to Grand Bergeronnes on the North Shore and Ft. Rupert on James Bay, in Ontario north to Ogoki and Nipigon, in Manitoba north to Lake Winnipeg, in Alberta north to Edmonton, to southern British Columbia and Vancouver Island, south into Washington and Oregon, apparently skipping California and Nevada (old state records dubious) but appearing in Arizona, Utah, New Mexico, Texas, along the

Gulf of Mexico eastward into Georgia but not Florida.

Maine localities (37): Adamstown Township (CNC), Allagash (UNH), Anson (CNC), Auburn (RENC), Augusta (MFS), Bancroft (CNC), Bar Harbor (PROC), Batchelders Grant Township (RENC), Belgrade (RENC), Carrabassett Valley (CNC), Chesuncook Township (UNH), Clinton (RENC), East Millinocket (CNC), Elliottsville Township (MFS), Eustis (CNC), Fairfield (RENC), Fort Kent (UNH), Fryeburg (CNC), Hancock (CNC), Lewiston (MFS), Lincoln (MFS), Marion Township (MFS), Millinocket (UNH), Monmouth (UNH), Mount Vernon (MFS), Nesourdnahunk Township (CNC), New Sharon (RENC), Norridgewock (RENC), Princeton (MFS), Sidney (RENC), Strong (RENC), Cross Lake Township (MFS), T3 R11 WELS (MFS), T6 R11 WELS (MFS), Turner (MFS), Warren (MFS), Waterville (RENC), Winslow (RENC).

***Stenolophus conjunctus* (Say) (Plate 44)**

Habitat: Open dry areas, including cultivated fields, roadsides, gardens, sand and gravel pits, lawns, rock ledges, dry upper parts of stream banks, grassy areas at cliff tops, and tundra above treeline.

Flight dynamics: Wings dimorphic; both light trap records and daytime flight observations for macropterous individuals.

Biology: Teneral adults appear in late March, but also from July to September; gravid females appear from May to late June; diurnal, often found under goldenrod roots.

General range: A transcontinental species. North-east to Nova Scotia, in Québec north to the Gaspé Peninsula, Tadoussac and Abitibi, in Ontario north to Nipigon, northwest to southern Manitoba, Saskatchewan and Alberta, in British Columbia north to Williams Lake and west to Vancouver Island, south through Washington, Oregon, and California to Arizona, east to Texas, the Gulf of Mexico coast, and Florida.

Maine localities (10): Jim Pond Township (RENC), Lincoln Plantation (CNC), Magalloway Plantation (RPWC), Mount Katahdin Township (PVT), Mount Vernon (MFS), Newfield (CNC), South Berwick (CNC), Waterville (RENC), Winslow (RENC), York (PVT, RENC).

***Stenolophus fuliginosus* Dejean (Plate 44)**

Habitat: Quiet water margins including beaver ponds, slow streams, small pools, and margins of bogs up to 900 m elevation.

Flight dynamics: Fully winged; light trap records, diurnal flight in spring.

**Biology:** Teneral adults appear from mid-June to mid-August; at least one record from a beaver lodge.

**General range:** A transcontinental species of southern Canada and approximately the northern half of the USA. Northeast to Newfoundland, in Québec north to Port-Cartier on the North Shore and Abitibi, in Ontario north to Nipigon, in Alberta north to Edmonton, in British Columbia west to Vancouver Island; also in Washington and Oregon, south to Idaho, Wyoming, Nebraska, Arkansas, Illinois, Ohio, and Virginia, as well as south in the mountains to Alabama and South Carolina.

**Maine localities (26):** Bar Harbor (PROC), Baring Plantation (CNC), Brookton Township (CNC), Camden (CNC), Carrabassett Valley (CNC, PVT), Castine (PVT), Clinton (RENC), Monmouth (CNC), Mount Desert (PROC), Mount Katahdin Township (PVT), Mount Vernon (MFS), Newfield (RPWC), Newport (RENC), Oakfield (RPWC), Orono (MFS), Portage Lake (MFS), Reed Plantation (CNC), Sandy River Plantation (RENC), Sidney (RENC), Southwest Harbor (PROC), T11 R10 WELS (MFS), T4 R10 WELS (CNC), Washburn (RENC), Waterville (RENC), West Forks Plantation (CNC), Winslow (RENC).

***Stenolophus fuscatus* Dejean (Plate 44)**

**Habitat:** On sandy soil, usually near water but also in sand and gravel pits.

**Flight dynamics:** Fully winged, no light trap records but specimens from mountain tops are probably stray fliers.

**Biology:** Teneral adults appear in August.

**General range:** An east-central species. Northeast to New Brunswick, in Québec north to Québec City, Montreal, in Ontario north to Belleville and north shore of Lake Erie, west to South Dakota, south to Illinois, Indiana, Ohio, Pennsylvania, and New Jersey.

**Maine localities (7):** Caratunk (RENC), Lebanon (CNC), Mount Vernon (RPWC), Naples (CNC), Newfield (CNC, RPWC), Reed Plantation (CNC), Steuben (UVM).

***Stenolophus humidus* Hamilton (Plate 44)**

**Habitat:** Eutrophic marshes with cattails and willows.

**Flight dynamics:** Fully winged, no light trap records.

**Biology:** Unknown.

**General range:** An eastern species. Northeast to Nova Scotia, in Québec only in extreme southwestern portion at Frelighsburg and Rigaud, in Ontario west to Delhi; in the USA, west to Ohio, south to West Virginia, the Carolinas, Georgia, and Alabama.

**Maine locality (1):** Monmouth (CNC).

***Stenolophus lecontei* (Chaudoir) (Plate 44)**

**Habitat:** Along shores of rivers and lakes, in sandy areas under drift and dry mud cakes.

**Flight dynamics:** Fully winged, in light trap records.

**Biology:** Teneral adults appear from mid-July to mid-August. Mainly a midwestern species, uncommon in east.

**General range:** An eastern and central North American species. Northeast to central Maine, in Québec north to Laniel near Lake Temiscamingue, in Ontario north to Southampton on Lake Huron, northwest to Michigan, Wisconsin, and Minnesota, west to Iowa, Missouri, Oklahoma, and Texas, south to the Gulf of Mexico and Florida.

**Maine localities (4):** Fairfield (RENC), Rome (RENC), Sidney (RENC), Waterville (RENC).

***Stenolophus lineola* (F.) (Plate 44)**

**Habitat:** Sandy ground.

**Flight dynamics:** Fully winged, in light trap records.

**Biology:** Recorded as burrowing on golf greens

**General range:** An eastern and central North American species, with a range also extending into the Southwest. Northeast to central Maine, in Québec north to Berthierville, in Ontario on the shores of Lakes Erie and Ontario, in Manitoba north to Lake Winnipegosis, in Saskatchewan north to Kandahar, in southern Alberta at Medicine Hat, west to southeastern British Columbia, south to Idaho, Utah, Arizona, south to New Mexico, Texas, and along the Gulf of Mexico states to Florida.

**Maine localities (5):** Arundel (MFS), Kennebunk (MFS), Lebanon (UNH), Lewiston (MFS), Mount Vernon (MFS).

***Stenolophus ochropezus* (Say) (Plate 44)**

**Habitat:** In muddy and vegetative margins of standing water among sedges or cattails, in mats of moss or on bare mud, on all sorts of shores from small isolated pools to rivers and lakes.

**Flight dynamics:** Fully winged; very abundant at light traps.

**Biology:** Teneral adults appear in September; there are also records from beaver lodges. The abundance at light traps suggests that much of the population travels among small, temporary pools and wet spots.

**General range:** An eastern and central North American species with a range extending into the American Southwest. Northeast to Nova Scotia and New Brunswick, in Québec north to Québec City, Montreal, and Hull, in Ontario north to Sudbury, in southern Manitoba to Portage LaPrairie, west to South Dakota, Nebraska,

Colorado, Utah, and Arizona, south to New Mexico, Texas, the Gulf of Mexico, and Florida.

Maine localities (19): Albany Township (CNC), Alfred (RPWC), Auburn (CNC), Bar Harbor (PROC), Bigelow Township (UVM), Brunswick (MFS), Eustis (CNC), Fryeburg (CNC), Jefferson (RENC), Kennebunk (MFS), Lebanon (CNC), Mount Vernon (MFS), Newfield (RPWC), Norridgewock (RENC), Prospect (MFS), Sidney (RENC), T2 R9 WELS (RENC), Topsfield (MFS), Waterville (RENC).

***Stenolophus plebejus* Dejean (Plate 44)**

Habitat: Stream margins, on beach drift.

Flight dynamics: Fully winged, multiple light trap records.

Biology: Teneral adults appear in September; has been collected from a beaver lodge.

General range: An eastern and central species. Northeast to central Maine, in Québec north to Gatineau, in extreme southern Ontario (Victoria), northwest to Michigan, west to Illinois, Missouri, Arkansas, and Texas, south to the Gulf States and Florida.

Maine localities (2): Bar Harbor (PROC), Fairfield (PVT).

***Stenolophus rotundicollis* (Haldeman) (Plate 44)**

Habitat: Reported from piles of dead grasses in an urban garden; generally an open-ground species but rare.

Flight dynamics: Fully winged; records from wind-drift material on lake shores in southern Ontario.

Biology: A spring breeder, overwintering as adults.

General range: A northeastern species. In southern Québec only, at LaTrappe and Gatineau Park, and at Long Point and Point Pelee in southern Ontario. Northeast to Maine, west to Ohio, south to Tennessee and South Carolina.

Maine locality (1): Lewiston (MFS).

**Genus *Acupalpus***

***Acupalpus canadensis* Casey (Plate 1)**

Habitat: In vegetation near marshes, swamps, and ponds.

Flight dynamics: Wings full, frequent flier at dusk; regularly attracted to artificial lights.

Biology: Nocturnal; adults overwinter.

General range: Newfoundland to Saskatchewan south to South Dakota and Pennsylvania.

Maine localities (3): Allagash (CNC), Belgrade (RENC), Waterville (RENC).

***Acupalpus carus* (LeConte) (Plate 1)**

Habitat: In dense vegetation near marshes, wet ditches, and along shorelines especially with

emergent grasses and sedges. Common near beaver ponds.

Flight dynamics: Hind wing dimorphic; long-winged form comes to light.

Biology: Nocturnal, probably omnivorous. Overwinters as an adult.

General range: Newfoundland to South Dakota, south to Arkansas and Delaware. Apparently an isolated population in Washington and Idaho.

Maine localities (21): Allagash (UNH), Augusta (UNH), Bar Harbor (PROC), Blanchard Township (RENC), Cape Elizabeth (RENC), Chesuncook Township (UNH), Clinton (RENC), Cross Lake Township (UNH) Dennysville (UNH), Eustis (CNC), Gardiner (UNH), Limerick (UNH), Lincoln (UNH), Monmouth (CNC), Newport (RENC), Pittston (UNH), Princeton (UNH), Smithfield (RENC), T17 R4 WELS (UNH), Topsfield (UNH), Winslow (RENC).

***Acupalpus indistinctus* Dejean (Plate 1)**

Habitat: Most often under cover, near water.

Flight dynamics: Fully winged. Comes to light.

Biology: Adults overwinter.

General range: Maine west to Wisconsin, including southernmost Ontario; south to Texas and Florida.

Maine localities (2): Chesuncook Township (UNH), Presque Isle (UVM).

***Acupalpus nanellus* Casey (records from Majka et al. (2011)) (Plate 1)**

Habitat: Wet ground along eutrophic bodies of water, marshes, and swamps, on soft organic-rich soils in shade of wetland plants such as sedges and cattails.

Flight dynamics: Most but not all are fully winged and capable of flight.

Biology: Generally found from March to August, with teneral adults appearing from April to July. Overwinters as adult. Egg-laying seasonality unknown.

General range: In the Northeast, from Nova Scotia west to Ontario, Michigan and Wisconsin, south to Connecticut and Rhode Island.

Maine localities (2): Bingham (PVT), Vassalboro (PVT).

***Acupalpus partarius* (Say) (Plate 1)**

Habitat: In lowland vegetation, debris and moist soil near water; under wet stones (Procter 1946).

Flight dynamics: Fully winged. Comes to light.

Biology: Both diurnal and nocturnal. Adults overwinter.

General range: From Nova Scotia west to southern Ontario, southwest to South Dakota, Kansas, and Oklahoma, south to Texas, Louisiana,

Mississippi, Alabama, and South Carolina; a Georgia record needs confirmation.

Maine localities (3): Augusta (UNH), Bar Harbor (UVM, PROC), T1 R13 WELS (UNH).

***Acupalpus pauperculus* Dejean (Plate 1)**

Habitat: In dense vegetation and debris near water; under wet stones (Procter 1946).

Flight dynamics: Fully winged. Comes to light.

Biology: Diurnal and nocturnal. Probably omnivorous. Adults overwinter.

General range: Nova Scotia and New Brunswick west to Colorado south to Kansas and Georgia.

Maine localities (18): Bar Harbor (PROC), Coplin Plantation (RPWC), East Millinocket (CNC), Eustis (CNC), Hancock (CNC), Lebanon (UNH), Moro Plantation. (CNC), Mount Vernon (MFS), Newfield (CNC, RPWC), Newport (RENC), Oakfield (RPWC), Oxford (CNC), Reed Plantation (CNC), Sidney (RENC), Steuben (UVM), T15 R15 WELS (CNC), Waterboro (RENC), Waterville (RENC).

***Acupalpus pumilus* Lindroth (Plate 1)**

Habitat: In dense vegetation and debris near marshes, swamps, and ponds.

Flight dynamics: Fully winged. Comes to light.

Biology: Nocturnal. Adults overwinter.

General range: Nova Scotia to Ontario, south to Nebraska and Delaware.

Maine localities (5): Belgrade (RENC), Blanchard Township (RENC), Newfield (RPWC), Newport (RENC), Waterboro (RENC).

***Acupalpus testaceus* Dejean (state record only from Bousquet and Laroche (1993) and Bousquet (2010))**

Habitat: Open, moist to wet ground by rivers, ponds, marshes, or even puddles in vacant lots.

Flight dynamics: Fully winged; sometimes occurs in drift material, but frequently comes to artificial lights in the spring.

Biology: Generally nocturnal but diurnal during the spring; overwinters as adults, teneral adults appearing in mid-summer.

General range: In the East, from Florida west to Texas, north to Ontario, east to Québec, New Hampshire, and Maine.

Maine localities: No specific Maine localities known.

**Subtriba Harpalina**

**Genus *Ophonus***

***Ophonus puncticeps* Stephens (Plate 37)**

Habitat: A synanthropic species, typical of weedy ground and often found in contracted inflorescences of Queen Anne's-lace (*Daucus carota* L.; Apiaceae).

Flight dynamics: Fully winged, common at light traps. Stray specimens on mountain tops.

Biology: In the Old World, teneral adults appear in June and July. The major part of the larval diet is seeds of Queen Anne's-lace.

General range: An adventive Old World species.

Predominantly European but also in western Asia, north to southern Scandinavia, west to England and Ireland, south to northern Spain, central Italy and Albania, east to Asia Minor, Syria, the Caucasus, and mouth of the Volga River. First collected on Long Island, New York in 1957; subsequent records document its spread to Poughkeepsie, New York (1969), Vermont (1972), Massachusetts (1973), Maine (1977), and Québec (1985). Currently ranges northeast to Nova Scotia, west to Québec and Ontario, southwest to Ohio, south to Pennsylvania and New Jersey.

Maine localities (6): Fairfield (PVT), Old Orchard Beach (UVM), Sabattus (RENC), Sidney (RENC), Skowhegan (PVT), Waterville (RENC).

**Genus *Harpalus***

***Harpalus affinis* (Schrank) (Plate 31)**

Habitat: In dry, open areas with much bare ground, with gravel, sand, humus soil or peat, strongly synanthropic in most of its range, as in gardens around homes, but the northward penetration in Newfoundland, Québec, and Ontario is also into naturally open areas.

Flight dynamics: Fully winged, flight observed in Europe.

Biology: Teneral adults appear from early August to early October; mating observed in July, gravid females found from April to August; species sometimes found sheltering under roots of goldenrod.

General range: An adventive Old World species.

Common throughout Europe except for the far north, across Asia to the Pacific Ocean, south to the Mediterranean, Turkey, Armenia, and Kyrgyzstan. Introduced into North America probably before 1805. Northeast to Labrador and Newfoundland, in Québec north to James Bay, in Ontario north to Cochrane and Sioux Lookout, northwest to Minnesota, west to Kansas, south to Missouri, Illinois, Ohio, and Virginia. A disjunct population occurs in western Washington and Oregon.

Maine localities (24): Blue Hill (RENC), Carrabasset Valley (CNC), Clinton (RENC), Cutler (CNC), East Millinocket (CNC), Ellsworth (MFS), Fort Kent (CNC), Hancock (CNC), Lewiston (MFS), Lubec (RENC), Machias (PVT), Millinocket (CNC), Mt. Katahdin Township (CNC), Mount Vernon (MFS), Orono (MFS), Sabattus (RENC),

Sanford (UVM), Sidney (RENC), Steuben (UVM), T11 R10 WELS (MFS), T11 R14 WELS (MFS), T15 R13 WELS (CNC), T16 R9 WELS (MFS), Waterville (RENC).

***Harpalus caliginosus* (F.) (Plate 31)**

Habitat: Open, sparsely vegetated ground, such as croplands and pastures.

Flight dynamics: Fully winged, light trap records.

Biology: Sometimes diurnally active, observed climbing plant stalks, synanthropic, seen in western Ohio abundant beneath drying hay, wheat, or oat shocks, reported preying on small insects, diet reported to consist 33% caterpillars, 67% dried vegetation. In early autumn seen eating extensively on ragweed seeds. Other reports indicate that it is sometimes a pest on strawberries. Gravid females appear in mid-September, teneral adults emerge from late July to early September.

General range: A transcontinental species. Northeast to Nova Scotia, in Québec north to Gaspé, Saguenay and Abitibi, in Manitoba north to Lake Manitoba, in Montana north to the Yellowstone River, northwest to the Olympic Peninsula of Washington, west to the US Pacific coast to southern California; in Mexico south to Sonora, Durango, and Tampico; in the eastern USA, ranges to both the Gulf and Atlantic coasts but is apparently absent from peninsular Florida.

Maine localities (4): Islesboro (PVT), Orono (MFS), Rangeley (PVT), Skowhegan (PVT).

***Harpalus compar* LeConte (Plate 31)**

Habitat: In dry fields, croplands, pastures and wastelands, seemingly common in sand areas. On the other hand, it has also been collected in large numbers in a floodplain forest in Ohio.

Flight dynamics: Fully winged, frequent at light traps.

Biology: Mating occurs in August, gravid females have been seen from mid-August to early October; the larva hibernates.

General range: An eastern and central North American species. Northeast to Nova Scotia, in Québec north to Baie-St-Paul (Charlevoix- Ouest), north to Mt. Tremblant, in Ontario north to Michipicoten River, Thunder Bay, northwest to Selkirk, Manitoba, west to North Dakota, Wyoming, Colorado, southwest to Arizona, south to New Mexico, Texas, Louisiana, and Florida.

Maine localities (3): Bangor (CNC), Leeds (RENC), Waterville (RENC).

***Harpalus erraticus* Say (Plate 31)**

Habitat: Characteristic of sandy areas, e.g., sand plains, cultivated fields, and gardens provided soil is sufficiently sandy.

Flight dynamics: Fully winged, light trap records.

Biology: Adults and larvae live in vertical burrows 30–70 cm deep, adult burrows usually have side chambers, the larva lives in a vertical burrow topped by a mound of soil fragments. It stores seeds of foxtail grass (*Setaria*) by pressing them into the walls of the burrow. The larvae do not eat the seeds, but it is postulated that the teneral adults do. Teneral adults appear in mid- to late June, mating takes place in August through September; the species hibernates as adult.

General range: An eastern and central North American species. Northeast to western Maine, in Québec north to Québec City, north to La Tuque, Mt. Tremblant and Ft. Coulonge, in Ontario north to Lake of the Woods, northwest to southern Manitoba, Saskatchewan, and Alberta, west to eastern Montana, Colorado, southwest to New Mexico, south to Kansas, Arkansas, Mississippi, Alabama, and Georgia but not Florida, north to Illinois, Indiana, Ohio, New York, New Jersey, and the New England states.

Maine localities (3): Bethel (CNC), Fryeburg (RPWC), Waterville (PVT).

***Harpalus erythropus* Dejean (Plate 31)**

Habitat: Open fields and forest edges.

Flight dynamics: Fully winged, frequent at light traps.

Biology: Teneral adults appear in August through September; has been observed climbing a tree to a height of 3 m.

General range: An eastern and central North American species. Northeast to Nova Scotia, in Québec northeast to Québec City, north to Montreal and Ottawa, Ontario, northwest to Winnipeg, Manitoba and Riding Mountain, west to the Dakotas and Wyoming, south to Colorado, Oklahoma, Arkansas, Alabama, and Florida.

Maine localities (6): Fairfield (PVT), Mount Vernon (MFS), Naples (CNC), Sidney (RENC), Steuben (MFS), Waterville (RENC).

***Harpalus faunus* Say (Plate 31)**

Habitat: Open, sandy areas including sand banks along rivers.

Flight dynamics: Fully winged, light trap records.

Biology: Gravid females appear in early September; the larva hibernates, and teneral adults begin to appear in early July.

General range: An eastern and central North American species. Northeast to central Maine, in Québec north to Joliette, in Ontario north to Ottawa and Manitoulin Island, northwest to Winnipeg, Manitoba, west to the Dakotas,

Colorado, southwest to Arizona, south to Texas, Arkansas, Louisiana, the Gulf Coast, and Florida.

Maine localities (5): Fryeburg (RPWC), Lewiston (MFS), Sabattus (RENC), Turner (RENC), Vassalboro (PVT).

***Harpalus fulvilabris* Mannerheim (Plate 31)**

Habitat: Usually a forest species found in leaf litter, but also on coastal tundra; once taken on steep, barren cliffs in Vermont.

Flight dynamics: Dimorphic, but the macropterous form is very rare, no flight records.

Biology: Teneral adults appear in late June to early August, gravid females also appear in early August.

General range: A transcontinental, northern species. Northeast to Newfoundland and Labrador, in Québec north to Schefferville, in Ontario and Manitoba north to Hudson Bay, in Alberta north to McMurray, in Yukon north to Dawson, in Alaska west to Kodiak Island and the eastern Aleutian Islands, in British Columbia west to Williams Lake, south in the mountains to Colorado and the Black Hills of South Dakota, in Michigan on the upper peninsula and Isle Royale, in Québec south to the St. Lawrence River, isolated in the mountains of Vermont, New Hampshire, and New York.

Maine localities (9): Kineo Township (PVT), Moro Plantation (CNC), Mount Katahdin Township (PVT), Naples (CNC), Nashville Plantation (MFS), T4 R10 WELS (CNC), T9 R5 WELS (MFS), Topsham (RENC), Weld (PVT).

***Harpalus herbivagus* Say (Plate 32)**

Habitat: In New England, abundant in gravel pits, dry, open fields and gardens, in drier habitats than *Harpalus somnulentus* Dejean; in the western states, abundant in wheat fields.

Flight dynamics: Fully winged, in light trap records.

Biology: Teneral adults emerge from March to September, gravid females appear from late May to early July, adults have been observed feeding on grass shoots.

General range: A nearly transcontinental species but only reaching the Pacific on the east side of the Olympic Peninsula of Washington. Northeast to Nova Scotia and New Brunswick, in Québec north to Saguenay River, Mt. Tremblant, and Lac Temiscamingue, in Ontario north to Thunder Bay and Lake of the Woods, in southern Manitoba and Saskatchewan, in Alberta north to Edmonton; in British Columbia only in the Okanogan Valley, in Washington west to Puget Sound region including the east side of the Olympic Peninsula, south in the mountains to southern Oregon Cascades, south

from eastern British Columbia south to Idaho, Utah, Arizona, New Mexico, Arkansas, southern Alabama, and Georgia.

Maine localities (12): Albany Township (CNC), Alfred (RPWC), Carrabassett Valley (CNC), Charleston (RENC), Columbia Falls (RENC), Fairfield (RENC), Fryeburg (RPWC), Hollis (MFS), Mount Vernon (MFS), New Gloucester (MFS), Orono (UNH), Sabattus (RENC).

***Harpalus indigenus* Casey (Plate 32)**

Habitat: Open, dry sandy areas, also on mountain summits.

Flight dynamics: Fully winged, no flight records, but specimens have been found in ocean beach drift.

Biology: Found in jack pine forests with sandy substrate, teneral adults seen in June and August.

General range: A species restricted to the northeastern and north-central states. Northeast to Nova Scotia and New Brunswick, in Québec north to Port-au-Saumon, in Ontario north to Petewawa, in Michigan at the northern end of the lower peninsula, Iowa, South Dakota, in Nebraska west to the Sand Hills of McPherson Co. (north of North Platte), south to Pennsylvania and New Jersey, in New York in the Adirondacks and Albany, also in Connecticut, New Hampshire, and Vermont; widespread in Massachusetts, including Cape Cod, Martha's Vineyard, and the Elizabeth Islands.

Maine localities (10): Bigelow Township (UVM), Columbia Falls (CNC), Georgetown (UVM), Kibby Township (MFS), Leeds (RENC), Lewiston (MFS), Monmouth (MCZ), Mount Katahdin Township (PVT), Newfield (RPWC), Paris (MCZ).

***Harpalus laevipes* Zetterstedt (Plate 32)**

Habitat: Open areas with gravelly soil, forests and forest edges, under litter in bushes, abundant in regenerated burn areas.

Flight dynamics: Fully winged, no flight records.

Biology: Unknown.

General range: A circumpolar species. In the Old World, found in northern Europe including Scotland and northern England east to Siberia, in Siberia to the Kamchatka Peninsula and Sakhalin Island, isolated in the mountains in southern Europe (Pyrenees, Alps, mountains of former Yugoslavia and Bulgaria) and also mountains of Asia Minor, Syria, Urals, Caucasus, Pamirs, and the mountains of central and eastern Siberia. In North America, Northeast to Labrador and Newfoundland, in Québec north to Lac St. Jean and Abitibi, in Manitoba north to Southern Indian Lake, in the Northwest

Territories north to Ft. Simpson and Norman Wells, in Yukon north to Dawson, throughout British Columbia except for the Queen Charlotte Islands, south to Oregon, and in the mountains of Nevada, Arizona, and New Mexico; in eastern states south to northern Wisconsin, south-central Michigan, southern Ontario, western New York and the Adirondacks, the White Mountains of New Hampshire and central Maine.

Maine localities (4): Bethel (CNC), Kibby Township (MFS), Mount Vernon (MFS), Waterville (RENC).

***Harpalus laticeps* LeConte (Plate 32)**

Habitat: Fields, wastelands, seashores, alpine tundras, and sandy upland woods; has been found in abundance in regenerated burned areas.

Flight dynamics: Fully winged, no flight observations, but stragglers in sea drift suggest flight capability.

Biology: Teneral adults appear in June, and gravid females in early August.

General range: A transcontinental northern species. Northeast to Anticosti and Madeleine Islands, in Québec north to Schefferville and Great Whale River on Hudson Bay, in Ontario north to Pickle Lake, in Manitoba north to Gillam on the Nelson River, in the Northwest Territories north to Yellowknife and Norman Wells, in Yukon north to Dawson, in Alaska NW to Fairbanks, in the interior of British Columbia at Ft. St. John and Salmon Arm, in Washington on the Olympic Peninsula, in Oregon at Mary's Peak, in the Rocky Mountains south through Montana, Wyoming, Colorado, to central New Mexico, also in several mountain ranges in the Great Basin (Ruby Mountains in Nevada, Henry Mountains in Utah, and Santa Catalina Mountains of southern Arizona), also in the Black Hills of South Dakota, east of the Great Plains south to Minnesota, northern Illinois and Indiana, northern tip of southern peninsula of Michigan, in New York south to Ithaca, and several localities in eastern Massachusetts.

Maine localities (10): Bar Harbor (UVM), Fairfield (RENC), Fryeburg (RPWC), Orono (PVT), Paris (PVT), Parsonsfield (CNC), Reed Plantation (CNC), Sidney (PVT), Topsham (RENC), West Forks Plantation (CNC).

***Harpalus lewisii* LeConte (Plate 32)**

Habitat: Open, uncultivated sandy fields, sand pits, oak-pine woods, and regenerated burn areas.

Flight dynamics: Fully winged, light trap records.

Biology: Teneral adults peak in August.

General range: A northern and central species.

Northeast to Nova Scotia and New Brunswick, in Québec north to Sept Îles and Abitibi, in Ontario north to Thunder Bay, in Manitoba north to Lake Winnipeg, in the Northwest Territories north to Ft. Smith, in Alberta south to McMurray, south to southwestern Minnesota, southern Wisconsin, southern Ontario to Elmira, in New York south to shores of Lake Champlain, to New Haven, Connecticut and Fall River, Massachusetts.

Maine localities (7): Baldwin (PVT), Bethel (PVT), Columbia Falls (CNC), Lebanon (UNH), Orono (UNH), Paris (PVT), Turner (MFS).

***Harpalus megacephalus* LeConte (state record only from Bousquet (2010))**

Habitat: Lowland deciduous and particularly boreal coniferous forests, on dry but shaded ground.

Flight dynamics: Fully winged, occasionally found in wind-drift materials on lake shores.

Biology: Teneral adults appear in late summer (August-September); overwinter as adults.

General range: Incompletely known. Recorded from Nova Scotia, New Brunswick, Maine, Québec, Ontario, Michigan, Minnesota, and Manitoba.

Maine localities: No specific Maine localities known.

***Harpalus opacipennis* (Haldeman) (Plate 32)**

Habitat: Dry sandy areas with sparse vegetation, also found in grasslands and clearings in evergreen forests.

Flight dynamics: Fully winged, diurnal flight records.

Biology: Teneral adults can be found from May to October, peaking in July.

General range: A nearly transcontinental species.

Northeast to New Brunswick, in Québec to Lac St. Jean and St. Fidele but not reaching Saguenay, north to Abitibi, in Ontario north to Lake Timiskaming and Lake of the Woods, in the southern third of Saskatchewan, in the Northwest Territories to Ft. Simpson, in the Yukon north to Old Crow, north of the Arctic Circle, in Alaska west to Copper Center (inland across mountains from Valdez), west to Vancouver Island, British Columbia; in Washington west to Puget Sound, southwest to the Sierra Nevada of California, south to the mountains of central Arizona and central New Mexico, east to the Rocky Mountains and Black Hills, but absent from the Great Plains (except the Canadian provinces), south to Minnesota, northern Wisconsin, Indiana, western Pennsylvania, New York south to Ithaca, in Vermont south to Rutland, but not recorded from New Hampshire.

Maine localities (4): Bigelow Township (UVM), Fairfield (RENC), Sidney (RENC), Waterville (RENC).

***Harpalus pensylvanicus* (DeGeer) (Plate 32)**

Habitat: Almost any kind of open habitat, including gardens, waste ground, croplands, roadsides, gravel pits, clear cuts in forests, with some records from mountain tundra (possibly strays from lowlands).

Flight dynamics: Fully winged, frequent at light traps.

Biology: Some adults overwinter; old adults lay eggs in late summer into early autumn; larvae overwinter in any instar. Teneral adults appear from early July to late August, with fully sclerotized new adults appearing from August into October. Larva lives in a burrow and stores grass seeds pressed into the walls of the burrow.

General range: A transcontinental species. Northeast to Nova Scotia and New Brunswick, in Québec north to Port-au-Saumon and Abitibi, in Ontario north to Sault Ste. Marie, in Manitoba north to Lake Winnipeg, in British Columbia north to Salmon Arm and west to Agassiz, to Alaska, and all the 48 contiguous states and into northern Mexico.

Maine localities (35): Abbot (RENC), Albany Township (CNC), Alfred (RENC), Augusta (MFS), Belgrade (RENC), Brunswick (MFS), Charleston (RENC), Eustis (MFS), Fairfield (RENC), Fryeburg (RPWC), Islesboro (PVT), Kennebunk (MFS), Lebanon (UNH), Leeds (RENC), Lewiston (MFS), Lincoln (MFS), Lyman (RENC), Mechanic Falls (RENC), Monmouth (MFS), Mount Vernon (MFS, RENC), New Sharon (RENC), Newfield (CNC), Sabattus (RENC), Sanford (UVM), Shapleigh (RPWC), Stoneham (RENC), T14 R15 WELS (CNC), Cross Lake Township (MFS), T9 R9 WELS (MFS), Topsfield (MFS), Tremont (RENC), Turner (MFS, RENC), Waterboro (MFS), Waterford (RENC), Waterville (RENC).

***Harpalus plenalis* Casey (Plate 32)**

Habitat: Gravel pits, dry, stony ground with sparse vegetation.

Flight dynamics: Fully winged, no flight records.

Biology: Teneral adults appear from mid-April through May, and again in August.

General range: A transcontinental species. Northeast to Newfoundland, in Québec north to Gaspé, Lac St. Jean, and Abitibi, in Ontario north to Lake of the Woods, in southern Manitoba, Saskatchewan, in the Northwest Territories north to Ft. Simpson, in southern British Columbia west to Agassiz, south to

northwestern Arizona, Santa Fe, New Mexico, and Brazos County, Texas; east to Asheville, North Carolina; in New England, south to the Boston area.

Maine localities (2): East Millinocket (CNC), Millinocket (CNC).

***Harpalus providens* Casey (Plate 32)**

Habitat: Forest edge or woodlands under stones. Vermont records were from a dry ridge, in thin oak-hickory forest.

Flight dynamics: Fully winged, no flight records.

Biology: Teneral adults seen from May into November, peaking in August.

General range: A northeastern and north-central North American species. Northeast to eastern Maine, in Québec northeast to Trois Rivières vicinity and to Ft. Coulonge, in Ontario to Ottawa area, north to Upper Peninsula of Michigan, northwest to Pelican Lake, Minnesota, west to central Iowa, southwest to Ashland, Missouri, south to Kentucky, northern Alabama, West Virginia, and Maryland.

Maine localities (5): Bangor (CNC), Bethel (CNC), Leeds (RENC), Weld (PVT), Winslow (PVT).

***Harpalus reversus* Casey (Plate 33)**

Habitat: In the West, on grasslands and wheat fields; in the East, among sparse vegetation on gravel or sandy areas.

Flight dynamics: Fully winged, in light trap records.

Biology: Primarily a seed eater but has been taken at carrion and feeding on moth pupae from June into September, peaking in July.

General range: An eastern and central species. It was a grassland species of the Great Plains until 1900 when it began extending its range eastward, reaching Massachusetts by 1913. Northeast to northeastern Maine near the Aroostook River, in Québec northeast to Portneuf, in Ontario north to Thunder Bay, in Manitoba north of Lake Winnipeg, in Saskatchewan north to Cold Lake, northwest to Edmonton, Alberta, western edge of range follows eastern edge of the Rocky Mountains south to New Mexico, in all the Great Plains States from Kansas north, east of the Great Plains the southern limit is southern Wisconsin central Michigan, central New York and Massachusetts.

Maine locality (1): Oxbow Plantation (MFS).

***Harpalus rubripes* (Duftschmid) (Plate 33)**

Habitat: Dry gravelly or sandy soil with sparse vegetation, partly synanthropic, found in the limestone barrens (alvars) on the Baltic Islands. In the southern part of its European range, it becomes more of a forest species.

**Flight dynamics:** Fully winged, no flight records but likely a strong flier based on rapid dispersal.

**Biology:** In Europe, known to breed in spring and fall.

**General range:** An adventive Old World species.

In the Old World from southern Sweden and the south coast of Norway and the British Isles, south to southern Spain, Sicily, Greece, Asia Minor, Syria, and the Caucasus, across Siberia to the Pacific coast and Sakhalin Island. It is a fairly recent introduction in the New World, first recorded from Rye, New Hampshire in 1981, but by 1986 had reached central Maine (Waterville); also known from Connecticut and Rhode Island, recorded from Montreal (1994) and Newbury, Vermont (1995). It is now abundant throughout New Brunswick.

**Maine localities (8):** China (RENC), Columbia Falls (RENC), Cumberland (RENC), Fryeburg (RPWC), Lewiston (MFS), Sabattus (RENC), Waterville (RENC), Windsor (RENC).

### ***Harpalus rufipes* (DeGeer) (Plate 33)**

**Habitat:** A synanthropic species, in meadows, gardens, fields, croplands, occasionally in open woodlands. In Europe, reported to be abundant beneath piles of grain or potato tops.

**Flight dynamics:** Fully winged, many light trap records.

**Biology:** Most females breed in their second year and some again in the third year. Hibernating adults overwinter deep in the soil. Adults omnivorous, feeding on insect larvae, aphids, and seeds, including many herbs such as goosefoot and smartweed, but also on cereals and strawberries which are often damaged by the beetles.

**General range:** An adventive Old World species. North to southern Scandinavia and British Isles, south to southern Spain, Sicily, Crete, North Africa, Azores, Asia Minor, Armenia, Iran, and western and central Siberia, also in Japan (no records from eastern Siberia). Recorded from Prince Edward Island in Canada in 1937, the Gaspé Peninsula (1941), Newfoundland (1949), and is now abundant throughout New Brunswick; probably in Maine since the 1940s as huge populations had built up in the potato growing districts of northern Maine before 1960, southern Maine (1970), New Hampshire (1974), and Vermont (1990).

**Maine localities (39):** Albany Township (CNC), Athens (RENC), Caratunk (RENC), Caribou (MFS), Cherryfield (RENC), Columbia Falls (RENC), Cumberland (RENC), East Millinocket (CNC), Enfield (MFS), Fairfield (RENC), Garfield Plantation (MFS), Georgetown (UVM), Harrington (UVM), Lewiston (MFS), Lubec (PVT, RENC), Matinicus Isle Plantation (MFS), Monmouth (MFS), Monticello (MFS), Mount

Vernon (MFS), New Sharon (RENC), Norridgewock (RENC), Orono (MFS), Orrington (MFS), Palermo (MFS), Portland (PVT), Reed Plantation (CNC), Sabattus (RENC), Sidney (PVT), Steuben (MFS), T14 R5 WELS (MFS), Topsfield (MFS), Turner (MFS, RENC), Vanceboro (MFS), Washburn (RENC), Waterboro (RENC), Waterville (PVT, RENC), Whitefield (MFS), Wilton (CNC).

### ***Harpalus solitaris* Dejean (Plate 33)**

**Habitat:** On sandy or gravelly soil with sparse vegetation, in Canada on till and in gravel pits; in Europe recorded from open heaths, and also on dry grassland, light pine forests and in birch forests in the mountains.

**Flight dynamics:** Fully winged, in light trap records.

**Biology:** Teneral adults emerge from June to August, breeds in spring and also in the fall.

**General range:** A circumpolar species. Known from Scandinavia, northern Russia, across Siberia to the Pacific, isolated in the European Alps, northeast to Labrador and Newfoundland, in Québec north to Ungava Bay, in Manitoba north to Hudson Bay, in the Northwest Territories north to Yellowknife, northwest to Alaska, in the Rocky Mountains of British Columbia and Alberta, south to Thunder Bay, Ontario; in Québec south to 47<sup>th</sup> parallel, and south only to mountains of Gaspé, in the mountains of New Hampshire, and in northern Maine and also on the southeastern coast of Maine.

**Maine localities (3):** Harrington (RENC), Reed Plantation (CNC), T1 R9 WELS (RENC).

### ***Harpalus somnulentus* Dejean (Plate 33)**

**Habitat:** In relatively moist forest edges, fields, croplands, gardens, roadsides, and trails or clearings in forests. In wetter weather, in more open habitats such as open fields and gravel pits, and orchards; has been taken in a beaver house.

**Flight dynamics:** Fully winged; there are intercept trap records, but no light trap records.

**Biology:** Teneral adults appear from March through September, peaking in June.

**General range:** A transcontinental species. The species as currently recognized includes five forms ("morphs") formerly ranked as species. Two of these, *fallax* and *pleuriticus*, occur in the Northeast. These forms could be regarded as cryptic species which have not yet evolved barriers to hybridization. This is a complex problem which needs more study. The species as a whole ranges northeast to Labrador and Newfoundland, in Québec north to Schefferville and Ungava Bay, in Ontario and Manitoba nearly reaching Hudson Bay, in the Northwest Territories north to Norman Wells, in the Yukon north to Dawson, in Alaska north to the Arctic Circle, west to

Fairbanks and the interior and Matanuska, south in the mountains to California, Arizona and New Mexico, in the Great Plains south to Kansas, Arkansas, northern Alabama, West Virginia, and Virginia.

Maine localities (50): Albany Township (CNC), Ashland (RENC), Auburn (CNC), Augusta (MFS), Belgrade (RENC), Bigelow Township (UVM), Camden (CNC), Canaan (RENC), Carrabassett Valley (CNC, PVT), Columbia Falls (CNC), East Millinocket (CNC), Fairfield (RENC), Fort Kent (CNC), Garfield Plantation (MFS), Garland (RENC), Islesboro (PVT), Kennebunk (MFS), Kibby Township (MFS), Lubec (RENC), Millinocket (CNC), Moro Plantation (CNC), Mount Katahdin Township (CNC), Naples (CNC), Nesourdnahunk Township (CNC), Newfield (CNC), Parsonsfield (CNC), Reed Plantation (CNC), Saint Francis (CNC), Sanford (RPWC), Sidney (RENC), Squapan Township (CNC), T10 R8 WELS (MFS), T11 R10 WELS (MFS), T11 R7 WELS (MFS), T11 R8 WELS (MFS), T12 R7 WELS (MFS), T14 R15 WELS (CNC), T14 R6 WELS (MFS), T14 R7 WELS (MFS), T15 R13 WELS (CNC), T16 R4 WELS (MFS), T3 R8 WELS (MFS), T4 R10 WELS (CNC), T5 R11 WELS (RPWC), T5 R9 WELS (CNC), T9 R5 WELS (MFS), Washburn (RENC), Waterville (PVT, RENC), Winterville Plantation (MFS), York (PVT).

### Genus *Trichotichnus*

#### *Trichotichnus autumnalis* (Say) (Plate 46)

Habitat: In leaf litter in open woods in Maryland.

The habitat is not clear for more northern records, most of which are from lake or ocean shores, although the Arrowsic, Maine record was from coastal dry red oak forest litter. These could be normal habitats or the specimens could have come in as drift.

Flight dynamics: Fully winged, no flight records, but shoreline specimens suggest flight capability.

Biology: Unknown.

General range: An eastern and central North American species. Northeast to southern and western Maine, north to northern New Hampshire and Vermont, in Ontario north to shores of Lake Erie and Lake Ontario, northwest to Michigan and Wisconsin, west to Illinois, south to Indiana, Ohio, West Virginia, and Georgia.

Maine localities (2): Arrowsic (RENC), Riley Township (UVM).

#### *Trichotichnus vulpeculus* (Say) (Plate 46)

Habitat: Deciduous forests under bark of fallen logs, especially in logged areas.

Flight dynamics: Fully winged, in light trap records.

Biology: Unknown.

General range: An eastern and central North American species. Northeast to New Brunswick, in Québec north to Québec City and Oka, in Ontario north to Ottawa and Toronto, west to Minnesota, Missouri, south to Alabama, Georgia, and Florida.

Maine localities (2): Waterville (RENC), Winslow (PVT).

### Genus *Selenophorus*

#### *Selenophorus ellipticus* Dejean (records from Majka *et al.* (2011)) (Plate 43)

Habitat: Open, particularly disturbed, habitats, such as forest clearings, agricultural fields, suburban gardens; on open, dry ground with at most discontinuous vegetation.

Flight dynamics: Fully winged and capable of flight, not uncommon in wind-drift materials.

Biology: Adults may be found in any month of the year; timing of emergence of teneral adults and egg-laying seasonality apparently unknown.

General range: In the East, from Florida west to Louisiana and Texas, north to Kansas, Arkansas, Missouri, and Michigan, east to Ontario, New York, and Maine; not yet known from Québec or the Maritime Provinces of Canada.

Maine localities (3): Fairfield (PVT), Litchfield (PVT), Washington (PVT).

#### *Selenophorus gagatinus* Dejean (Plate 43)

Habitat: A pronounced xerophile, on rock ledges, gravel pits, sandy hillsides, dry oak forests on ridge tops.

Flight dynamics: Fully winged, in light trap records.

Biology: Teneral adults appear in late August, found hiding under goldenrod roots.

General range: An eastern and central North American species. Northeast to New Brunswick, in Québec north to Québec City, in Ontario north to Ottawa and Belleville, northwest to Michigan, west to Illinois and Missouri, south to Arkansas and Texas, along the Gulf of Mexico to Florida.

Maine localities (12): Belgrade (RENC), Caratunk (RENC), Clinton (RENC), Codyville Plantation (RPWC), Columbia Falls (CNC), East Millinocket (CNC), Fryeburg (RPWC), Monmouth (RENC), Parsonsfield (CNC), Sebago (CNC), T2 R9 WELS (RENC), Windham (MFS).

#### *Selenophorus hylacis* (Say) (Plate 43)

Habitat: Deciduous forests, under bark.

Flight dynamics: Fully winged, in light trap records.

Biology: Unknown.

General range: An eastern and central North American species. Northeast to central Maine,

north to Conway, New Hampshire, Burlington, Vermont, and Albany, New York; west across southern Ontario (Point Pelee) to southern Michigan and Illinois, south through Kansas to Oklahoma, Arkansas, Mississippi, Alabama, and Florida.

Maine locality (1): Mount Vernon (MFS).

***Selenophorus opalinus* (LeConte) (Plate 43)**

Habitat: Open, dry, sandy ground under stones and leaves.

Flight dynamics: Fully winged, light trap records, common on drift material on lakes.

Biology: Teneral adults appear from August through October.

General range: An eastern and central North American species. Northeast to New Brunswick, in Québec north to Bellechasse Co., in Ontario north to Ottawa and Grand Bend on Lake Huron, Michigan, Minnesota, South Dakota, south to Kansas, Oklahoma, and Texas, east along the Gulf of Mexico to Florida.

Maine localities (5): Alfred (RENC, RPWC), Leeds (RENC), Mount Vernon (MFS), Parsonsfield (CNC), Turner (MFS).

**Tribe Pentagonicini**

**Genus *Pentagonica***

***Pentagonica picticornis* Bates (Plate 38)**

Habitat: Unknown.

Flight dynamics: Unknown.

Biology: Wings full.

General range: The only species in a genus otherwise restricted to the deep south of the USA, the Caribbean Basin, and Central and South America. From southern Maine, New Hampshire, and Vermont, south to Maryland; west across southern Québec and Ontario to Michigan, southwest through Illinois to Kansas, New Mexico, and Texas; south at least to Guatemala in Central America (**type locality**). Apparently not known south of Maryland on the east side of the Mississippi River.

Maine locality (1): Portland (PVT).

**Tribe Sphodrinii**

**Genus *Pseudamara***

***Pseudamara arenaria* (LeConte) (Plate 39)**

Habitat: Forests, on gravel or sandy areas, among dry leaves, also in seashore drift.

Flight dynamics: Wings dimorphic, in light trap records.

Biology: Teneral adults appear in May and October. Has been swept from vegetation on the summit of Mt. Washington, New Hampshire;

also sifted from grass and leaf litter at lower elevations.

General range: A northeastern and north-central species. Northeast to Nova Scotia and New Brunswick, in Québec north to Lac St. Jean, in Ontario south to Toronto and Southampton, west to Wisconsin, Illinois, south to Ohio, Pennsylvania, and West Virginia.

Maine localities (10): Bancroft (CNC), Belgrade (RENC), Columbia Falls (MFS), Cutler (CNC), Greenville (MFS), Kibby Township (MFS), Riley Township (UVM), Sherman (MFS), T3 R8 WELS (MFS), T6 R11 WELSD (UVM).

**Genus *Calathus***

***Calathus gregarius* (Say) (Plate 21)**

Habitat: Abundant in dry, well-drained litter of deciduous forests, often in brushy second growth or at or beyond the edges of forests, usually not in deep forests with large trees; sometimes in open fields bordering forests.

Flight dynamics: Wings dimorphic, fully winged form rare, no flight records.

Biology: Teneral adults appear from late May to mid-August, probably overwinters as adult or larva, gregarious.

General range: An east-central species. Northeast to Cape Breton Island, Nova Scotia, and New Brunswick, in Québec north to Lac St. Jean, in northern Michigan to Lake Superior, west to Minnesota and South Dakota, south to Nebraska, Missouri, Alabama, and Georgia.

Maine localities (7): Albion (RENC), Bethel (MCZ), Bar Harbor (PROC, UVM), Deer Isle (RENC), Gouldsboro (PROC), Presque Isle (UVM), Washburn (RENC).

***Calathus ingratus* Dejean (Plate 21)**

Habitat: In litter of deciduous, mixed, and conifer forests, rarely near forest edges, commonly under pieces of wood, in rotten logs, and in leaf litter, rarely under stones; from near sea level in northwestern Vermont up to the limit of trees at 1,300 m.

Flight dynamics: Wings dimorphic, macropterous form rare, no flight records.

Biology: Gravid females appear from late June to mid-August, teneral adults emerge from May to August.

General range: Transcontinental and more northern than preceding species. Northeast to Newfoundland and Labrador, in Québec north to Ft. Chimo on Ungava Bay, in Ontario north to Hudson Bay, in the Northwest Territories, north to Norman on the Mackenzie River, in Alaska west to the Alaska Peninsula and inner Aleutian Islands, reaching the south coast at Skagway; in British

Columbia nearly throughout but not reaching the coast; in the western states of the USA, south in the mountains of California, Arizona, and New Mexico, east of the Rocky Mountains south to South Dakota, Minnesota, Wisconsin, northern Michigan, the Adirondacks, and the mountains of northern New England as well as lower elevations near the Canadian border.

**Maine localities (61):** Allagash (MFS), Ashland (MFS), Bar Harbor (MFS), Baring Plantation (MFS), Bethel (MCZ), Chain of Ponds Township (CNC), Dead River Township (MFS), Edmunds Township (CNC), Eustis (MFS), Frenchtown Township (UNH), Grande Isle (MFS), Herseytown Township (MFS), Jackman (CNC), Kibby Township (MFS), Lee (RPWC), Lincoln Plantation (MFS), Masardis (MFS), Moro Plantation (CNC), Mount Desert (UNH), Mount Vernon (MFS), Nesourdnahunk Township (CNC), Berry Township (MFS), Oxbow Plantation (MFS), Parmachenee Township (MFS), Saint Agatha (MFS), Saint Francis (MFS), Steuben (UVM), Stockholm (MFS), Sweden (CNC), T10 R3 WELS (MFS), T11 R15 WELS (MFS), T11 R7 WELS (MFS), T11 R8 WELS (MFS), T12 R11 WELS (MFS), T12 R13 WELS (MFS), T12 R7 WELS (MFS), T13 R8 WELS (MFS), T14 R6 WELS (MFS), T14 R7 WELS (MFS), T14 R9 WELS (MFS), T15 R13 WELS (MFS), T15 R8 WELS (MFS), T16 R4 WELS (MFS), T17 R4 WELS (MFS), T18 R10 WELS (MFS), T18 R11 WELS (MFS), T2 R4 WELS (MFS), T2 R9 WELS (MFS), T4 R10 WELS (MFS), T4 R13 WELS (MFS), T6 R11 WELS (MFS), T8 R3 WELS (MFS), T8 R5 WELS (MFS), T8 R8 WELS (MFS), T8 R9 WELS (MFS), T9 R13 WELS (MFS), T9 R5 WELS (MFS), T9 R7 WELS (MFS), Upton (CNC), Waldo (CNC), Washburn (RENC).

***Calathus opaculus* LeConte (state record from Bousquet and Larochelle (1993) and Bousquet (2010, 2012))**

**Habitat:** Open, dry substrates from oak woodlands to vacant lots, fields, and dry meadows.

**Flight dynamics:** Fully winged, occasionally attracted to artificial lights at night; appears to be favored by human disturbance.

**Biology:** Teneral adults appear in June and July, adults overwinter and may be found throughout the year.

**General range:** East of the Rockies, from southern Québec and Ontario west to Minnesota and Utah, south to Arizona, Texas, and Florida, north to Vermont and New Hampshire.

**Maine localities:** No specific Maine localities known.

**Genus *Acalathus***

***Acalathus advena* (LeConte) (plate 1)**

**Habitat:** Moist forest soils, forest margins and meadows in alpine and subalpine environments, at lower elevations in higher latitudes.

**Flight dynamics:** Wings full, occasionally found in wind-drift materials, implying flight capability; sometimes burrows into the ground and hides by day beneath bark and in moss.

**Biology:** Egg-laying takes place in early summer (late June-July); teneral adults appear from July to October, but mostly earlier in this time range.

**General range:** Transcontinental from Newfoundland to Southern Alaska, including Kodiak Island and the Alaska Peninsula, south in the mountains to Arizona, New Mexico, Colorado, and New Hampshire.

**Maine localities 2:** Mount Desert (MFS), Mt. Katahdin Township (MFS).

**Genus *Synuchus***

***Synuchus impunctatus* (Say) (Plate 45)**

**Habitat:** Deciduous forests, common in second-growth forest and on forest margins, occurs to treeline and sometimes beyond; Lindroth recorded the species on dry till under raspberry or blackberry bushes.

**Flight dynamics:** Wings dimorphic, fully winged form rare but has been observed in flight.

**Biology:** Teneral adults appear from June to September, but overwinters as larva; gravid females begin to appear in early August. An abundant species but rarely shelters under superficial cover, only pit trapping reveals its true numbers. It is known to cache the seeds of *Melampyrum* (cowwheat; Scrophulariaceae), a plant that is parasitic on pine roots. The beetles find the seeds one at a time and take them to a hiding place. The beetle then eats the edible carbuncle off the end of the seed and then abandons the seed and hunts for another one. In this way, it accumulates piles of seeds which will sprout in the future.

**General range:** A transcontinental species. Northeast to Newfoundland, in Québec north to Schefferville and Abitibi, in Ontario north to Lake Nipigon and Rainy River, in Alberta north to McMurray, in British Columbia north to Fraser Lake, west to the coast at Vancouver, south into Washington; also in southern Alberta, Saskatchewan, South Dakota, Missouri, Kentucky, and Virginia (possibly Georgia).

**Maine localities (99):** Adamstown Township (CNC), Albany Township (CNC), Alfred (RENC), Allagash (UNH), Anson (CNC, RENC), Auburn (RENC), Augusta (MFS), Bancroft (CNC), Bar

Harbor (MFS, PROC), Batchelders Grant Township (RENC), Belgrade (RENC), Bethel (CNC), Caratunk (RENC), Carrabassett Valley (CNC), Chain of Ponds Township (CNC), Chesuncook Township (UNH), Cornish (CNC), Deer Isle (RENC), East Millinocket (CNC), Edmunds Township (CNC), Elliotsville Township (MFS), Eustis (CNC), Fairfield (RENC), Fort Kent (UNH), Fryeburg (CNC, RPWC), Garland (RENC), Gilead (CNC), Gouldsboro (PROC), Grafton Township (CNC), Hancock (CNC), Haynesville (MFS), Hiram (CNC), Isleboro (PVT), Jackman (CNC), Kibby Township (MFS), Lebanon (UNH), Lee (RPWC), Lewiston (MFS), Lincoln (MFS), Lyman (CNC, RENC), Marion Township (MFS), Milbridge (MFS, RENC), Millinocket (CNC, UNH), Monmouth (UNH), Moro Plantation (CNC), Moscow (RENC), Mount Desert (PROC, UNH), Mount Katahdin Township (RENC), Mount Vernon (MFS), Naples (CNC), Nashville Plantation (MFS), Nesourdnhunk Township (CNC), New Sharon (RENC), Norridgewock (RENC), Oxbow Plantation (MFS), Oxford (CNC), Portage Lake (MFS), Princeton (MFS), Reed Plantation (CNC), Rockwood Strop T1 R1 (MFS), Sidney (RENC), Steuben (UVM), Stoneham (RENC), Stow (RENC), Strong (RENC), T1 R9 WELS (RENC), T10 R3 WELS (MFS), T11 R7 WELS (MFS), T11 R8 WELS (MFS), T12 R7 WELS (MFS), T14 R15 WELS (CNC), T14 R6 WELS (MFS), T14 R7 WELS (MFS), T15 R13 WELS (CNC), T16 R4 WELS (MFS), Cross Lake Township (MFS), T2 R12 WELS (MFS), T2 R4 WELS (CNC), T3 R11 WELS (MFS), T3 R8 WELS (MFS), T5 R9 WELS (CNC), T6 R11 WELS (MFS, UVM), T8 R5 WELS (MFS), T8 R8 WELS (MFS), T8 R9 WELS (MFS), T9 R5 WELS (MFS), T9 R7 WELS (MFS), Trout Brook Township (RENC), Turner (MFS), Unity (RENC), Upton (CNC), Warren (MFS), Washburn (RENC), Waterboro (RENC), Waterville (RENC), West Forks Plantation (CNC), Winslow (RENC), Winterville Plantation (MFS), Woolwich (MFS).

### Tribe Platynini

#### Subtribe Platynina

#### Genus *Olisthopus*

#### *Olisthopus micans* LeConte (Plate 36)

Habitat: Forests under masses of dead leaves and twigs, especially in seasonally flooded areas and along margins of vernal ponds.

Flight dynamics: Fully winged, in light trap records.

Biology: Unknown.

General range: An eastern species. Northeast to Maine, in Québec north to Québec City and

Montreal, in Ontario north to Parry Sound, west to Michigan, Wisconsin, southwest to Iowa, Missouri, Arkansas, and Louisiana, south to the Gulf of Mexico and east to the Atlantic coast.

Maine locality (1): Lyman (RENC).

#### *Olisthopus parmatus* (Say) (Plate 36)

Habitat: Deciduous forests usually among leaves.

Flight dynamics: Fully winged, flight observations.

Biology: Females gravid in mid-May; an aggregation of adults was found on a wind-thrown mound, where a tree had been uprooted, in November.

General range: An eastern and central North American species. Northeast to Nova Scotia and New Brunswick, in Québec north to St. Fidèle and Abitibi, in Ontario north to Parry Sound, north to Minnesota, west to Illinois, Missouri, Arkansas, south to the Gulf of Mexico, east to the Atlantic Ocean.

Maine localities (3): Batchelders Grant Township (RENC), Kibby Township (MFS), Sidney (RENC).

#### Genus *Sericoda*

#### *Sericoda obsoleta* (Say) (Plate 43)

Habitat: Burnt forests.

Flight dynamics: Fully winged, in light trap records.

Biology: Has been observed flying directly to burning wood and arriving in great numbers at hot ashes, sometimes in houses with wood stoves and campfires. Teneral adults appear in late August.

General range: A mostly northern, transcontinental species (with isolated southern records). Northeast to Newfoundland and southern Labrador, in Québec north to Great Whale River, in Manitoba north to Churchill, in the Northwest Territories north to Ft. Smith, in British Columbia west to Terrace and Vancouver; in Washington, west to Puget Sound, in Oregon west to Portland and Eugene, south to Klamath Co.; found in northern Idaho, but absent from Rockies and Great Plains, south to Topeka, Kansas, St. Louis, Missouri, eastern Tennessee, North Carolina, and Tybee Island on the coast of Georgia, an isolated record in Texas at Lee Co. and another from Mexico City.

Maine localities (9): Bangor (CNC), Bethel (CNC), Greenville (MFS), Isle Au Haut (CNC), Kennebunkport (CNC), Phillips (CNC), Rangeley (CNC), T35 MD (MFS), Wesley (MFS).

#### *Sericoda quadripunctata* (DeGeer) (Plate 43)

Habitat: Burnt forests.

Flight dynamics: Fully winged, in light trap records.

Biology: Comes to burned areas when ashes are still hot.

**General Range.** A Holarctic species. In the Old World, from the British Isles northeast through Scandinavia and south in continental Europe to Austria and Hungary, across Siberia to Kamchatka on the Pacific, from the Himalaya to China, Tibet, Manchuria, and northern Vietnam; in the Philippines on Luzon and Negros, on Taiwan and in Japan on Hokkaido. In the New World, a northern transcontinental species with a few isolated records farther south. Northeast to Labrador, in Québec north to the North Shore, Lac St. Jean, and Abitibi, in Ontario north to Cochrane and Nipigon, in Manitoba north to Gillam on the Nelson River, in Alberta north to Fort McMurray, in British Columbia north to Finlay Forks on the Peace River, west to the Pacific including Vancouver Island, in Alaska north to Fairbanks, south to the Kenai Peninsula; from British Columbia, south in Washington to Olympia and Pullman, south in Idaho to Coeur d'Alene, in Montana south to Helena, south into South Dakota, northern Illinois, and southern Michigan; in Pennsylvania south to Pittsburgh and Philadelphia; isolated populations are known in New Mexico and Smoky Mountains of North Carolina and Tennessee.

**Maine localities (9):** Augusta (UNH), Bar Harbor (UNH), Big Moose Township (MFS), Calais (UNH), Greenville (MFS), Lincoln (UNH), Princeton (MFS), T16 R5 WELS (MFS), T17 R4 WELS (UNH).

### Genus *Paranchus*

#### *Paranchus albipes* (F.) (Plate 37)

**Habitat:** Seashore, on steep, clayish, muddy slopes under stones and plant debris.

**Flight dynamics:** Fully winged, no flight records.

**Biology:** Most of the population breeds in fall but some breed in spring.

**General range:** An Old World species introduced in the New World. In Europe, from the British Isles and Scandinavia, south to southern Spain, Italy, the Balkans, Russia east of the Urals, south to Asia Minor and North Africa. Introduced into Newfoundland by 1840. In the Northeast to Newfoundland, New Brunswick, Nova Scotia, and Maine.

**Maine locality (1):** Cutler (CNC).

### Genus *Oxypselaphus*

#### *Oxypselaphus pusillus* (LeConte) (Plate 37)

**Habitat:** Lake-margin and bottomland forests in damp places under fallen leaves, under bark; sometimes concentrated around permanently wet spots by shaded rock ledges, or in dense

moss mats around bases of trees in seasonally flooded areas.

**Flight dynamics:** Fully winged, no flight records.  
**Biology:** There is a record of a concentration found in a beaver lodge, but it is not an obligate inhabitant of this habitat.

**General range:** A transcontinental species. Northeast to Nova Scotia and New Brunswick, in Québec north to Lac St. Jean and Abitibi, in Ontario north to Parry Sound, in Saskatchewan north to Saskatoon, west to south-central British Columbia, south to Oregon, Idaho, Montana, South Dakota, Iowa, Illinois, Ohio, and Pennsylvania, south in the mountains to Georgia.

**Maine localities (22):** Albion (RENC), Appleton (CNC), Belgrade (RENC), Camden (CNC), Canaan (RENC), China (RENC), Corinna (RENC), Fairfield (RENC), Fryeburg (RPWC), Hiram (CNC), Islesboro (PVT), Lewiston (MFS), Mount Vernon (MFS), Nesourndahunk Township (CNC), Orono (MFS), Sidney (PVT), Squapan Township (CNC), Washburn (RENC), Waterville (RENC), Wayne (CNC), Winslow (RENC), Winthrop (CNC).

### Genus *Agonum*

#### *Agonum aeruginosum* Dejean (Plate 1)

**Habitat:** In dense vegetation near open or forested marshes, bogs, and swamps from sea level to 900 m.

**Flight dynamics:** Fully winged, comes to light. Climbs trees and shrubs.

**Biology:** Adults overwinter.

**General range:** Nova Scotia to South Dakota, south to Mississippi and Florida.

**Maine localities (25):** Albany Township (CNC), Auburn (CNC), Bar Harbor (UNH), Belgrade (RENC), Blanchard Township (RENC), Cathance Township (RPWC), Durham (RPWC), Fryeburg (RPWC), Guilford (RENC), Lebanon (UNH), Lewiston (MFS), Litchfield (CNC), Lyman (RENC), Mercer (RENC), Monmouth (CNC), Mount Desert (MFS, UVM), Mount Vernon (MFS), New Vineyard (RENC), Newfield (RPWC), Rumford (CNC), Sanford (CNC), South Berwick (MFS), Troy (RENC), Waterboro (RENC), Whiting (RPWC).

#### *Agonum affine* Kirby (Plate 2)

**Habitat:** Among emergent sedges and grasses, often on soft soils. In Vermont recorded only at high altitudes.

**Flight dynamics:** Fully winged. Comes to light.

**Biology:** Nocturnal. Eggs are laid from June into July in Québec.

**General range:** Transamerican, from Labrador west to Alaska, south to Wyoming and New Jersey.

Maine localities (3): Bar Harbor (PROC), Blanchard Township (RENC), Squapan Township (CNC).

***Agonum anchomenoides* Randall (Plate 2)**

Habitat: Under driftwood and other cover along rivers, brooks, and lakeshores.

Flight dynamics: Fully winged; multiple flight records at light traps.

Biology: Nocturnal. Egg-laying takes place in June and July, teneral adults emerge in August and September. Adults overwinter.

General range: Transamerican, from Newfoundland west to central Alaska (Fairbanks, Fort Yukon, Circle), south to Washington, Montana, Wyoming, and Colorado, east across Nebraska, Iowa, Illinois, and Indiana to Pennsylvania, New Jersey, and Connecticut.

Maine localities (18): Adamstown Township (CNC), Allagash (MFS), Anson (CNC), Auburn (CNC), Augusta (**type locality; type specimen lost**), Bancroft (CNC), Bigelow Township (UVM), Chain of Ponds Township (CNC), East Millinocket (CNC), Eustis (CNC), Fort Kent (CNC), Grand Isle (CNC), Norridgewock (RENC), Sidney (PVT, RENC), T17 R4 WELS (MFS), T8 R5 WELS (CNC), Turner (MFS), Waterville (RENC).

***Agonum canadense* Goulet (Plate 2)**

Habitat: Among emergent tall reeds, sedges, and cattails; by pools and marshes; in alkaline fens.

Flight dynamics: Fully winged, comes to light.

Biology: Nocturnal; adults overwinter.

General range: Nova Scotia to Manitoba, south to northern Illinois and New Jersey.

Maine localities (12): Alfred (RPWC), Auburn (RPWC), Guilford (RENC), Hartland (RENC), Lee (RPWC), Lily Bay Township (UVM), Milo (CNC), New Vineyard (RENC), Newport (RENC), Orono (MFS), Ripley (RENC), Scarborough (PVT).

***Agonum crenistriatum* (LeConte) (Plate 2)**

Habitat: Dry, open areas under debris, sand hills, dunes, and alvars, sometimes on beaches.

Flight dynamics: Fully winged, no flight records.

Biology: Nocturnal. Possibly omnivorous. Adults overwinter.

General range: Nova Scotia and New Brunswick west to Minnesota, south to Arkansas and Virginia.

Maine localities (4): East Millinocket (CNC), Fryeburg (RPWC), Sabattus (RENC), Sebago (CNC).

***Agonum cupreum* Dejean (Plate 2)**

Habitat: Open fields with sparse vegetation and somewhat sandy soils.

Flight dynamics: Hind wings dimorphic. Long-winged forms comes to light.

Biology: Diurnal; adults overwinter. Lindroth (1968) suggested it spread eastward from the prairies rather recently. Strongly favored by human activities.

General range: Transamerican. From New Brunswick in the Northeast west to Alaska, south to Arizona and Maine. Range in the East is very narrow.

Maine locality (1): Carrabassett Valley (PVT).

***Agonum cupripenne* (Say) (Plate 2)**

Habitat: Dry, open forests and fields of every description, from lowland to alpine. Pastures, lawns, gardens, and other disturbed areas; high, open ledges. Strongly favored by human activities. Often in the same habitat as the adventive *Agonum muelleri* (Herbst), but this latter species can often be more common in mid- to late summer, *A. cupripenne* more so in spring and early summer.

Flight dynamics: Fully winged. Comes to light.

Biology: Diurnal. Adults overwinter.

General range: New Brunswick to Northwest Territories south to Arizona and North Carolina.

Maine localities (48): Albany Township (CNC), Alfred (RENC), Arundel (MFS), Athens (RENC), Auburn (RPWC), Augusta (RENC), Bar Harbor (UVM, PROC), Biddeford (PVT), Camden (CNC), Caratunk (UNH), Carrabassett Valley, (CNC), Columbia Falls (RENC), Coplin Plantation (RPWC), East Millinocket (CNC), Eliot (RPWC), Fairfield (RENC), Fryeburg (CNC), Gilead (RENC), Harrington (UVM), Jim Pond Township (RENC), Kibby Township (MFS), Lewiston (MFS), Magalloway Plantation (RPWC), Mechanic Falls (RENC), Montville (RENC), Mount Desert (PROC), Mount Vernon (MFS, RENC), Naples (CNC), Newfield (CNC), Orono (UNH, MFS), Phippsburg (RENC), Reed Plantation (CNC), Sabattus (RENC), Saint Francis (CNC), Sidney (RENC, PVT), Skowhegan (RENC), Steuben (UVM), T3 R8 WELS (RENC, MFS), T4 R10 WELS (CNC), T5 R18 WELS (RPWC), T6 R11 WELS (UVM), Upton (CNC), Waterford (RENC), Waterville (RENC), West Forks Plantation (CNC), Wilton (CNC), Windsor (RENC), Winslow (RENC).

***Agonum darlingtoni* Lindroth (Plate 2)**

Habitat: Sphagnum bogs, especially with emergent leatherleaf (*Chamaedaphne calyculata* (L.) Moench; Ericaceae) and sedges (*Carex* spp., *Eriophorum* spp.).

Flight dynamics: Fully winged, but no flight records.

Biology: Nocturnal. Teneral adults appear in September.

General range: New England states and adjacent Canadian Provinces, south to New Jersey.

Maine localities (9): Albany Township (RENC), Alfred (RPWC), Bar Harbor (UVM), Belgrade (RENC), Mount Desert (UVM), Sanford (RPWC), T1 R9 WELS (RENC), T2 R9 WELS (RENC), Waterboro (RENC).

***Agonum deceptivum* (LeConte) (Plate 2)**

Habitat: Little known. Lowland wet soil.

Flight dynamics: Fully winged. No flight records.

Biology: Nocturnal.

General range: Nova Scotia, New Hampshire, Maine, and Massachusetts; no records for New Brunswick, though it likely occurs there.

Maine localities (6): Bigelow Township (UVM), Chesuncook Township (UNH), Mount Desert (UNH), Mount Katahdin Township (RENC), Oakland (RENC), Sandy River Plantation (RENC).

***Agonum decorum* (Say) (records from Majka et al. (2011)) (Plate 2)**

Habitat: Marshy ground along standing waters and slow-moving streams.

Flight dynamics: Wings full, a regular flier, attracted to lights and occasionally found in wind-drift material on lakeshores.

Biology: Overwinters as adults, which can be found year-round, suggesting overall longevity of greater than a single year; egg-laying takes place in early summer (late June-July), while teneral adults appear in July and August.

General range: Much of the USA and southernmost Canada, from Québec west to British Columbia, south to California, Louisiana, and Florida.

Maine localities (2): Biddeford (PVT), Sanford (PVT).

***Agonum excavatum* Dejean (Plate 3)**

Habitat: On mud or muddy sand beside lakes, rivers, and beaver ponds, but apparently not along small streams. Usually in dense vegetation.

Flight dynamics: Fully winged. Comes to light. A record from the top of Mt. Washington was probably a stray.

Biology: At least partly diurnal; mating observed in the daytime. Teneral adults appear in mid-August. Adults overwinter.

General range: New Brunswick to Minnesota, south to Louisiana and Georgia.

Maine localities (10): Auburn (CNC), Berwick (CNC), Fairfield (RENC), Fryeburg (CNC, RPWC), Lewiston (MFS), Litchfield (CNC), Mercer (RENC), Mount Vernon (RPWC), Norridgewock (RENC), Sidney (RENC).

***Agonum extensicolle* (Say) (Plate 3)**

Habitat: Abundant on many kinds of open or shaded shorelines, from big rivers and lakes to

shaded mountain brooks. Usually on sandy-clay soil, but sometimes beneath cobbles and small boulders on sandy substrates.

Flight dynamics: Wings dimorphic, long-winged specimens have been observed to fly.

Biology: Active by day, mating observed in daytime. In Vermont, eggs are laid from mid-May to early July. Teneral adults in late June to mid-October.

General range: Adjacent Canadian provinces west to Montana, south to Mexico City and northern Florida.

Maine localities (50): Abbot (RENC), Anson (CNC), Appleton (CNC), Auburn (CNC, RENC), Bancroft (CNC), Bar Harbor (PROC), Batchelders Grant Township (RENC, UVM), Berwick (CNC), Burnham (RENC), Carrabassett Valley (UVM), Cathance Township (RPWC), Chain of Ponds Township (CNC), Cornish (CNC), Dixfield (RENC), East Millinocket (CNC), Farmington (RENC), Fort Kent (CNC), Fryeburg (CNC, RPWC), Gilead (CNC, RENC), Kingsbury Plantation (RENC), Lee (RPWC), Lewiston (MFS), Limerick (CNC), Litchfield (CNC), Madrid Township (CNC), Mercer (RENC), Moscow (RENC), Mount Desert (PROC), New Portland (RENC), Newry (UVM), Norridgewock (RENC), Northeast Carry Township (PVT), Oakland (RENC), Orono (MFS), Pittsfield (RENC), Sanford (CNC), Sebec (CNC), Sidney (RENC, PVT), Skowhegan (RENC), Stow (RENC), Strong (RENC), T10 SD (RPWC), Cathance Township (RPWC), T3 R11 WELS (RENC), T4 R10 WELS (CNC), T5 R9 WELS (CNC), Turner (RENC), Vienna (RENC), Waterville (RENC), Whitefield (RENC), Winslow (RENC).

***Agonum fidele* Casey (Plate 3)**

Habitat: Usually near standing waters in cattail marshes, under willows and alders. From near sea level to at least 1,000 m elevation in mountains.

Flight dynamics: Fully winged, comes to light.

Biology: Diurnal. Eggs are laid in July; adults overwinter.

General range: Nova Scotia and New Brunswick west to southern Ontario, south to Ohio and North Carolina.

Maine localities (27): Alfred (RENC), Appleton (RPWC), Bar Harbor (UVM), Batchelders Grant Township (RENC, UVM, MFS), Belgrade (RENC), Camden (CNC), Cape Elizabeth (RENC, PVT), Fairfield (RENC), Fryeburg (CNC), Hancock (CNC), Kibby Township (MFS), Lebanon (UNH), Lewiston (MFS), Mount Desert (UVM), Naples (CNC), New Gloucester (MFS), Sanford (RPWC), Sidney (RENC),

Sweden (CNC), T2 R9 WELS (RENC), T3 R10 WELS (RENC), T5 R18 WELS (RPWC), T6 R11 WELS (UVM), Vienna (RENC), Waterford (RPWC), Waterville (RENC), York (RPWC).

***Agonum gratiosum* (Mannerheim) (Plate 3)**

Habitat: In wet areas with emergent vegetation, usually *Carex* sedges, in seeps, forests, pastures, and hay meadows. Also in larger marshes by lakes, very common in *Carex* marshes near beaver ponds. Usually found in shaded areas.

Flight dynamics: Wings fully developed but weak-veined. Lindroth (1968) suggested it might lack the power of flight. May be a weak flier.

Biology: Mates from May to late July. Lindroth (1968) believed it hibernated in part as larvae, but this needs confirmation.

General range: Transcontinental, from Newfoundland to Alaska, south to Nebraska and Pennsylvania.

Maine localities (40): Acton (CNC), Albany Township (CNC, RENC), Appleton (RPWC), Belgrade (RENC), Blanchard Township (RENC), Cape Elizabeth (RENC), Carrabassett Valley (RENC, PVT), Chain of Ponds Township (CNC), Eustis (CNC), Fairfield (RENC), Fryeburg (CNC), Grand Isle (CNC), Hancock (CNC), Hartland (RENC), Hiram (CNC), Kibby Township (MFS), Lebanon (CNC) (UNH), Lubec (PVT), Madrid Township (CNC), Matinicus Isle Plantation (MFS), Mount Desert (UVM), Mount Katahdin Township (UNH), Mount Vernon (RENC) (MFS), Newport (RENC), Oakland (RENC), Orono (MFS), Perry (RPWC), Phippsburg (RENC), Rumford (CNC), Saint Francis (CNC), Sanford (CNC), Southwest Harbor (PROC), Sweden (CNC), T4 R10 WELS (CNC), T9 R5 WELS (MFS), T9 R7 WELS (MFS), Waterboro (RENC), Waterville (RENC), Wayne (CNC), Winslow (RENC).

***Agonum harrisii* LeConte (Plate 3)**

Habitat: Common in marshy margins of ponds, rivers, and lakes, in soft mud with *Carex* and cattails. Usually in more alkaline fen areas.

Flight dynamics: Fully winged. Comes to light.

Biology: Teneral adults in July. Adults overwinter.

General range: Nova Scotia to British Columbia, including Vancouver Island; south into Washington and Oregon, but not Idaho; Montana and Wyoming east to Pennsylvania, Virginia, and the New England states.

Maine localities (26): Adamstown Township (CNC), Albany Township (CNC), Auburn (RPWC), Bancroft (CNC), Bar Harbor (UVM), Baring Plantation (CNC), Bigelow Township (UVM), Blanchard Township (RENC), Chain of Ponds Township (CNC), Durham (RPWC),

Edmunds Township (CNC), Eustis (CNC), Guilford (RENC), Lee (RPWC), Litchfield (CNC), Milo (CNC), Monmouth (CNC), Mount Vernon (RPWC), Newport (RENC), Rangeley (UNH), Rumford (CNC), T5 R9 WELS (UNH), T8 R5 WELS (CNC), Troy (RENC), Warren (MFS), Whiting (CNC).

***Agonum lutulentum* (LeConte) (Plate 3)**

Habitat: Very common in cattail and *Carex* marshes associated with lakes and rivers, and the marshy borders of beaver ponds. Favors dense sedge tussocks at the outer edges where the water is deeper.

Flight dynamics: Fully winged, comes to light. Climbs trees and shrubs.

Biology: Nocturnal. Adults will accept grass seeds and apples in captivity (Larochelle and Lariviere 2003). Teneral adults appear in late August; adults overwinter.

General range: Transcontinental, from Nova Scotia to British Columbia, south to Kansas and New Jersey.

Maine localities (40): Abbot (RENC), Acton (CNC), Albany Township (CNC), Alfred (RPWC), Athens (RENC), Baring Plantation (CNC), Batchelders Grant Township (RENC), Belgrade (RENC), Big Moose Township (MFS), Blanchard Township (RENC), Brighton Plantation (RENC), Cape Elizabeth (RENC), Chain of Ponds Township (CNC), China (RENC), Clinton (RENC), Durham (RPWC), Glenwood Plantation (CNC), Guilford (RENC), Hartland (RENC), Jefferson (RENC), Lee (RPWC), Lincoln (UNH), Lubec (RPWC), Millinocket (MFS), Milo (CNC), Monmouth (CNC), New Sharon (RENC), New Vineyard (RENC), Newport (RENC), Perry (RPWC), Rumford (CNC), Saint Francis (UNH), Sanford (CNC), Steuben (MFS), Sweden (CNC), T3 R10 WELS (RENC), T8 R5 WELS (CNC), Troy (RENC), Waterville (RENC), Winthrop (CNC).

***Agonum melanarium* Dejean (Plate 3)**

Habitat: On soft, wet soil near water among cattails under trees and bushes, most common on mud banks on the shores of streams, rivers, and lakes, and near beaver ponds.

Flight dynamics: Fully winged. Comes to light.

Biology: Both nocturnal and diurnal. Eggs laid in late May and early June. Adults overwinter.

General range: Transcontinental, from Nova Scotia to British Columbia, south to Nebraska and North Carolina.

Maine localities (56): Albany Township (CNC), Anson (CNC), Appleton (CNC), Auburn (CNC, RENC), Augusta (MFS), Bancroft (CNC), Bar Harbor (UVM) (PROC), Baring Plantation

(CNC), Belgrade (RENC), Camden (CNC), Canaan (RENC), Cape Elizabeth (RENC), Carrabassett Valley (UVM, RENC), Chain of Ponds Township (CNC), Clinton (RENC), Connor Township (CNC), Corinna (RENC), Durham (RPWC), Fairfield (RENC), Fryeburg (RPWC), Garfield Plantation (MFS), Gilead (CNC), Grand Isle (CNC), Harrington (UVM), Hartland (RENC), Kibby Township (MFS), Lee (RPWC), Lewiston (MFS), Lily Bay Township (UVM), Long Pond Township (CNC), Madrid Township (CNC), Milo (CNC), Mount Desert (PROC), Mount Vernon (RPWC), Nesourndahunk Township (CNC), Norridgewock (RENC), Oakfield (RPWC), Oxford (CNC), Palmyra (RENC), Pittston Academy Grant (RPWC), Ripley (RENC), Sanford (CNC), Scarborough (PVT), Sidney (RENC, PVT), Southwest Harbor (PROC), Squapan Township (CNC), T2 R4 WELS (CNC), T4 R10 WELS (CNC), T8 R5 WELS (CNC), Troy (RENC), Vassalboro (UNH), Waterford (CNC), Waterville (RENC), Wayne (CNC), Whiting (CNC), Winthrop (CNC).

#### ***Agonum metallescens* (LeConte) (Plate 3)**

**Habitat:** Among sedges on margins of beaver ponds and the borders of other standing waters.

**Flight dynamics:** Fully winged; comes to light.

**Biology:** Egg-laying occurs in late June and July.

**General range:** Transcontinental, from Newfoundland to British Columbia, south to Montana and Massachusetts.

**Maine localities (15):** Adamstown Township (CNC), Bancroft (CNC), Bar Harbor (PROC), Batchelders Grant Township (RENC), Bigelow Township (UVM), Blanchard Township (RENC), Chain of Ponds Township (CNC), Guilford (RENC), Lee (RPWC), Mount Desert (PROC), Mount Katahdin Township (CNC, PVT), Rumford (CNC), T4 R10 WELS (CNC), T8 R5 WELS (CNC), Troy (RENC).

#### ***Agonum moerens* Dejean (Plate 3)**

**Habitat:** In Vermont, recorded from pool margins in lakeside floodplain forests; others record this species from marshy pools in forests.

**Flight dynamics:** Fully winged. Climbs trees and shrubs.

**Biology:** Nocturnal.

**General range:** Maine to Manitoba, south to Alabama and Florida.

**Maine localities (5):** Mount Vernon (RENC), New Sharon (RENC), New Vineyard (RENC), Waterboro (RENC), Waterville (RENC).

#### ***Agonum muelleri* (Herbst) (Plate 4)**

**Habitat:** Open and moderately dry gardens, croplands, and grassy fields. Occasionally in moun-

tain tundra (in Vermont). Strongly favored by human activities, often in the same habitat as *A. cupripenne*. This latter species will often be more common in spring, *A. muelleri* more so in late summer.

**Flight dynamics:** Fully winged, but no flight observations.

**Biology:** Diurnal. Eggs are laid in mid-June; adults overwinter.

**General range:** Newfoundland to Ontario south to Wisconsin and Virginia. An Old World species adventive in Newfoundland before 1840, with a separate introduction into British Columbia and California.

**Maine localities (32):** Augusta (UNH), Bancroft (CNC), Bar Harbor (UVM, PROC), Baring Plantation (CNC), Camden (CNC), Carrabassett Valley (CNC), Chain of Ponds Township (CNC), Clinton (RENC), Days Academy Grant Township (MFS), Fairfield (PVT, RENC), Gardiner (MFS), Garfield Plantation (MFS), Hartland (RENC), Jackman (CNC), Lewiston (MFS), Madrid Township (CNC), Montville (RENC), Moro Plantation (CNC), New Sharon (RENC), Norridgewock (RENC), Oakfield (RPWC), Orono (MFS, UNH), Orrington (MFS), Pittsfield (RENC), Rumford (CNC), Sabattus (RENC), Saint Francis (CNC), Sidney (RENC), T4 R10 WELS (CNC), Waterville (PVT, RENC), Whiting (CNC).

#### ***Agonum mutatum* Gemminger and Harold (Plate 4)**

**Habitat:** Sphagnum bogs and also in higher, wetter areas in sphagnum bordering beaver ponds, and smaller isolated areas with sphagnum wherever they occur in the mountains.

**Flight dynamics:** Most specimens have very small wings although not altered in shape. These individuals are probably flightless. Some, however, have large and probably functional wings. No flight observations. Collected primarily by bog treading.

**Biology:** Nocturnal.

**General range:** Transcontinental, from Newfoundland west to Alaska, south to Washington and South Carolina; seemingly interrupted in the Great Plains in the USA.

**Maine localities (17):** Alfred (RPWC), Appleton (RPWC), Bar Harbor (UVM), Dead River Township (MFS), Garfield Plantation (MFS), Gouldsboro (PVT), Lebanon (CNC), Lee (RPWC), Lincoln Plantation (RPWC), Monmouth (CNC), Mount Desert (PROC, UVM), Northport (RPWC), Oxbow Plantation (MFS), Rumford (CNC), Sanford (RPWC), T3 R10 WELS (RENC), Waterford (CNC).

***Agonum nigriceps* LeConte (Plate 4)**

**Habitat:** Among emergent sedges and cattails at margins of lakes, slow streams and rivers, and marshes. Clings head downwards on emergent plants. Often found where emergent plants are widely scattered and other carabids are absent. Mostly associated with sedge tussocks and cattails.

**Flight dynamics:** Hind wings dimorphic. No flight records. Collected primarily by marsh treading.

**Biology:** Nocturnal; hibernates as an adult.

**General range:** Holarctic. Newfoundland to Alaska, south to Idaho and Pennsylvania. Also in Siberia.

**Maine localities (2):** Blanchard Township (PVT, RENC), Chain of Ponds Township (CNC).

***Agonum nutans* (Say) (State record only from Bousquet and Laroche (1993) and Bousquet (2010))**

**Habitat:** Densely vegetated grasslands, such as abandoned fields, to open forest with herbaceous understory vegetation, often near small bodies of standing water, on dry to moderately moist soils, including calcareous substrates (alvars) and other rock ledges; perhaps in seaside grasslands.

**Flight dynamics:** Fully winged, often attracted to lights and found in wind-drift material on lakeshores.

**Biology:** Overwinters as adults, which may be found year-round; teneral adults appear from July to September. Egg-laying seasonality unknown.

**General range:** East of the Rockies and generally restricted to the USA, with records from Montreal, Québec, and Toronto, Ontario, south-westwards to South Dakota, Kansas, and Nebraska, south to Texas, Louisiana, and Florida

**Maine localities:** No specific Maine localities known; state record based on a single specimen in the Carnegie Museum labeled "ME".

***Agonum octopunctatum* (F.) (Plate 4)**

**Habitat:** On bare mud near water, invading bare fields in periods of wet weather.

**Flight dynamics:** Fully winged; comes to light. Has been observed flying by day in rain. Said to climb trees.

**Biology:** Mostly nocturnal. Adults overwinter.

**General range:** An eastern species. Ranges from Nova Scotia and New Brunswick across southern Canada to Minnesota, south to Texas and Florida.

**Maine localities (12):** Bancroft (CNC), Bar Harbor (PROC), Bigelow Township (UVM), Columbia Falls (MFS), Eliot (RPWC), Fairfield (RENC), Fryeburg (RPWC), Gilead (RENC), Mount Vernon (MFS), Cathance Township (RPWC), Waterford (RENC), Whiting (MFS).

***Agonum palustre* Goulet (Plate 4)**

**Habitat:** Woodland swamps and among emergent vegetation by the shores of ponds and slow rivers.

**Flight dynamics:** Fully winged. Comes to light.

**Biology:** Nocturnal.

**General range:** A northeastern species, from Maine, New Brunswick, and Québec west to Minnesota, then south to Kentucky and Virginia.

**Maine localities (10):** Auburn (CNC), Burnham (RENC), Canaan (RENC), Fairfield (RENC), Madrid Township (CNC), Mount Desert (UVM), Ripley (RENC), Sidney (RENC), Waterville (RENC), Wayne (CNC).

***Agonum piceolum* (LeConte) (Plate 4)**

**Habitat:** On gravelly or grassy shaded brook banks, or under pieces of bark near brooks, up to 1,600 m elevation on Mt. Washington, New Hampshire.

**Flight dynamics:** Hind wings dimorphic. No flight observations.

**Biology:** Nocturnal. Egg-laying takes place in late June. Teneral specimens have been seen in the White Mountains of New Hampshire from 30 June to 21 July.

**General range:** Transcontinental and northern, from Newfoundland to British Columbia and south in the USA only in the western mountains to southern California and Colorado; in the East, isolated in the mountains of Maine and New Hampshire, with recent records from northwestern New Brunswick.

**Maine localities (4):** Chain of Ponds (CNC), Gilead (CNC), Kibby (MFS), Mount Katahdin Township (RENC).

***Agonum picicornoides* Lindroth (Plate 4)**

**Habitat:** In Vermont, mostly at borders of beaver ponds; in New Brunswick, from debris in beaver dams. Farther north on shores of rivers and lakes, usually in shaded sites.

**Flight dynamics:** Fully winged. No flight observations.

**Biology:** Nocturnal. Egg-laying takes place in June.

**General range:** Transcontinental, northern and very local. New Brunswick to British Columbia and south in the USA only to the Huron Mountains of northern Michigan and the mountains of northern New England. The most southern record is Wilmington in southern Vermont.

**Maine localities (1):** T4R10 WELS (CNC).

***Agonum placidum* (Say) (Plate 4)**

**Habitat:** Common on sandy soil in open grassy and weedy places such as gardens, sand pits, roadsides, and croplands, occasionally in grassy, higher ground on broad sand bars in larger rivers. In winter, among leaf litter in forests.

**Flight dynamics:** Fully winged. Comes to light. One of the commonest ground beetles in light traps.

**Biology:** Mostly nocturnal; may be omnivorous.

Eggs are laid in June. Teneral adults appear from late July to early November; adults overwinter.

**General range:** Transcontinental and widespread.

From Newfoundland west to British Columbia, south into Mexico and all of the southern USA except possibly southernmost Florida.

**Maine localities (35):** Adamstown Township (CNC), Allagash (MFS, UNH), Anson (CNC), Auburn (MFS), Bar Harbor (PROC, UNH), Dennistown Plantation (MFS), East Millinocket (CNC), Elliotsville Township (MFS), Fairfield (RENC), Fort Kent (UNH), Greenville (MFS), Kennebunk (MFS), Kingfield (MFS), Lewiston (MFS), Lincoln Plantation (MFS), Marion Township (MFS), Millinocket (UNH), Monmouth (UNH), Mount Vernon (MFS), Norridgewock (RENC), Presque Isle (MFS), Sabattus (RENC), Seboomook Township (MFS), Southwest Harbor (PROC), T17 R4 WELS (UNH), Cross Lake Township (MFS), T18 R13 WELS (UNH), T3 R11 WELS (MFS), T8 R19 WELS (MFS), T8 R5 WELS (CNC), T9 R5 WELS (MFS), Topsfield (MFS), Washburn (RENC), Waterville (RENC), Winslow (RENC).

***Agonum propinquum* (Gemminger and Harold) (Plate 4)**

**Habitat:** Muddy margins of ponds and pools and along slow streams. Often among leaves.

**Flight dynamics:** Fully winged. Comes to light.

**Biology:** Nocturnal. Mating and egg-laying take place in early July; adults overwinter.

**General range:** Transcontinental and primarily northern, from Newfoundland to Alaska and south to California and New Jersey.

**Maine localities (7):** Blanchard Township (RENC), Carrabassett Valley (PVT), Durham (RPWC), Eustis (CNC), Lily Bay Township (UVM), Long Pond Township (CNC), Newport (RENC).

***Agonum retractum* LeConte (Plate 5)**

**Habitat:** Shaded deciduous forests in both urban and rural areas. Abundant in leaf litter and under sticks and small stones. Not associated with water.

**Flight dynamics:** Hind wings dimorphic, but macropterous specimens are relatively rare. No flight records.

**Biology:** Nocturnal. Teneral individuals appear in May and also in late August; adults overwinter.

**General range:** Transcontinental, from Newfoundland to British Columbia but not quite reaching the Pacific coast, south to Montana and Virginia.

**Maine localities (40):** Bar Harbor (UNH, UVM), Belgrade (RENC), Big Six Township (MFS),

Camden (CNC), Carrabassett Valley (PVT), Chain of Ponds Township (CNC), Deer Isle (RENC), Edmunds Township (CNC), Fairfield (RENC), Gouldsboro (PROC), Harrington (UVM), Jackman (CNC), Kibby Township (MFS), Lee (RPWC), Lewiston (MFS), Lubec (PVT), Moro Plantation (CNC), Mount Katahdin Township (RENC), Nesourndahunk Township (CNC), Norridgewock (RENC), Oxbow Plantation (MFS), Readfield (MFS), Saint Francis (MFS), Searsport (UNH), Sidney (RENC), Sweden (CNC), T14 R7 WELS (MFS), T15 R13 WELS (CNC), T16 R4 WELS (MFS), T16 R5 WELS (MFS), T2 R4 WELS (CNC), T3 R8 WELS (MFS), T4 R10 WELS (CNC), T5 R18 WELS (RPWC), T8 R11 WELS (UVM), T9 R5 WELS (MFS), Upton (CNC), Washburn (RENC), Waterville (RENC), Winterville Plantation (MFS).

***Agonum sordens* Kirby (Plate 5)**

**Habitat:** Very common on muddy soil or in moss mats or wet leaves, around small wet spots near marshes and beaver ponds. Also under alders and willows along rivers and small streams.

**Flight dynamics:** Fully winged; comes to light.

**Biology:** Mostly nocturnal. Teneral adults appear in late August; adults overwinter.

**General range:** Transcontinental and primarily northern, from Newfoundland to Alaska, south to Oregon and Maryland.

**Maine localities (29):** Bar Harbor (PROC, UVM), Baring Plantation (CNC), Batchelders Grant Township (RENC), Belgrade (RENC), Blanchard Township (RENC), Burnham (RENC), Canaan (RENC), Carrabassett Valley (UVM), Chain of Ponds Township (CNC), Edmunds Township (CNC), Elliotsville Township (MFS), Eastbrook (**type locality of *Europhilus frosti* Casey, a synonym**), Fairfield (RENC), Grand Isle (CNC), Guilford (RENC), Kibby Township (MFS), Lebanon (UNH), Mount Katahdin Township (RENC), Newport (RENC), Newry (UVM), Orono (UNH), Ripley (RENC), Sidney (PVT, RENC), Smithfield (RENC), T2 R4 WELS (CNC), T3 R8 WELS (RENC), Washburn (RENC), Waterville (RENC).

***Agonum superioris* Lindroth (Plate 5)**

**Habitat:** Among emergent sedges along margins of ponds, swamps, fens, and bogs.

**Flight dynamics:** Dimorphic in wing development: adults with poorly developed wings are incapable of flight, but no flight records for fully winged individuals.

**Biology:** Nocturnal. Adults probably overwinter.

**General range:** Transcontinental but northern and very local. New Brunswick to Alaska but south

into the USA only in Michigan and northern New England.

Maine localities (1): Belgrade (RENC).

***Agonum tenue* (LeConte) (Plate 5)**

Habitat: Marshy shores of large lakes to small ponds, among sedges or cattails.

Flight dynamics: Fully winged; comes to light. May climb trees.

Biology: Nocturnal. Teneral adults have been documented on 10 June in Québec. Adults overwinter.

General range: An eastern species, from Nova Scotia and New Brunswick west to Ontario, south to Nebraska, Indiana, and Georgia.

Maine localities (45): Acton (CNC), Adamstown Township (CNC), Albany Township (CNC, RENC), Alfred (RPWC), Bancroft (CNC), Bar Harbor (PROC), Baring Plantation (CNC), Batchelders Grant Township (RENC), Belgrade (RENC), Bigelow Township (UVM), Blanchard Township (RENC), Cape Elizabeth (RENC), Durham (RPWC), Eustis (CNC), Fairfield (RENC), Fryeburg (RPWC), Guilford (RENC), Hartland (RENC), Lebanon (CNC) (UNH), Lee (RPWC), Madrid Township (CNC), Milo (CNC), Monmouth (CNC), Mount Desert (UVM), Mount Katahdin Township (PVT), Mount Vernon (MFS) (RENC), New Sharon (RENC), New Vineyard (RENC), Newport (RENC), Ogunquit (CNC), Ripley (RENC), Rumford (CNC), T3 R10 WELS (RENC), T4 R10 WELS (CNC), T8 R11 WELS (RENC), Topsfield (MFS), Troy (RENC), Waterboro (RENC), Waterford (CNC), Waterville (RENC), Winslow (RENC), Winthrop (CNC).

***Agonum thoreyi* Dejean (Plate 5)**

Habitat: Marshes with emergent sedges or cattails, where vegetation is dense.

Flight dynamics: Fully winged; comes to light.

Biology: Nocturnal and probably omnivorous. Eggs laid in July and August, teneral adults appear in November in Québec. Adults overwinter.

General range: Holarctic and primarily northern. In North America, south to Washington and the mountains of California in the west, east of the Rockies to Kansas, New Jersey, and Newfoundland.

Maine localities (10): Batchelders Grant Township (RENC), Belgrade (RENC), Cutler (CNC), Eustis (CNC), Hartland (RENC), Mount Vernon (RPWC), Newport (RENC), Princeton (UNH), Saint Francis (CNC), T9 R5 WELS (UNH).

***Agonum trigeminum* Lindroth (Plate 5)**

Habitat: Among sedges and leaf litter under alders or willows at the margins of small, slow brooks,

beaver ponds, and marshes; usually associated with cleaner, cooler waters.

Flight dynamics: Fully winged; comes to light.

Biology: Mostly nocturnal. Adults overwinter.

General range: A northeastern species, from Nova Scotia and New Brunswick to Manitoba, south to Wisconsin, Ohio, and North Carolina.

Maine localities (20): Albany Township (RENC), Batchelders Grant Township (RENC), Belgrade (RENC), Cape Elizabeth (RENC), Carrabassett Valley (PVT), Eliot (RPWC), Guilford (RENC), Hancock (CNC), Hartland (RENC), Hope (CNC), Lee (RPWC), Lewiston (MFS), Matinicus Isle Plantation (MFS), Monmouth (CNC), Mount Vernon (MFS, RENC), New Vineyard (RENC), Newport (RENC), T1 R9 WELS (RENC), Vienna (RENC), Waterboro (RENC).

**Genus *Platynus***

***Platynus decentis* (Say) (Plate 38)**

Habitat: Deciduous forests, under bark and fallen logs. At least some individuals are arboreal in the summer, being encountered in canopy branches of freshly felled yellow birch (*Betula alleghaniensis* Britton; Betulaceae).

Flight dynamics: Vestigially winged, no light trap records.

Biology: Teneral adults appear in late April through late May, egg-laying occurs starting in early May; good climber, also found in beaver dams and houses. Overwinters as adult, often under bark of logs.

General range: A transcontinental species. Northeast to Newfoundland and Goose Bay, Labrador, in Québec north to James Bay, in Ontario north to Moose Factory, Hudson Bay, in the Northwest Territories north to Norman Wells and Yellowknife, northwest to Alaska, in British Columbia west to Skeena River, south to Oregon, in the Rockies south to Utah and New Mexico, south to Kansas, Louisiana, and Georgia.

Maine localities (113): Acton (RPWC), Albion (RENC), Alfred (RENC), Allagash (MFS), Appleton (CNC, RPWC), Ashland (MFS), Auburn (MFS, RENC), Augusta (MFS), Bar Harbor (PROC, UNH), Batchelders Grant Township (MFS, RENC), Beddington (MFS), Belgrade (RENC), Bethel (CNC), Bridgewater (MFS), Brookton Township (MFS), Buckfield (MFS), Bucksport (MFS), Burnham (RENC), Camden (CNC), Cape Elizabeth (PVT), Caratunk (RENC), Chain of Ponds Township (CNC), Chesterville (MFS), China (RENC), Clifton (MFS), Clinton (RENC), Corinna (RENC), Cutler (MFS), Dennistown Plantation (MFS), Ellsworth (UNH), Fairfield (RENC), Fryeburg

(RPWC), Garland (RENC), Gilead (CNC), Greenbush (MFS), Greenville (MFS), Hancock (CNC), Harrington (UVM), Islesboro (PVT), Kibby Township (MFS), Knox (MFS), Lebanon (UNH), Lewiston (MFS), Limestone (MFS), Lower Cupsuptic Township (MFS), Lyman (CNC), Madrid Township (CNC), Magalloway Plantation (MFS), Milford (MFS), Millinocket (MFS), Monmouth (UNH), Monroe (MFS), Mount Desert (PROC, UVM), Mount Katahdin Township (RENC), Mount Vernon (MFS), New Sharon (MFS), Newport (RENC), Newry (UVM), No. 14 Township (MFS), Norway (MFS), Orono (MFS), Orrington (MFS), Owls Head (PVT), Oxbow Plantation (MFS), Phippsburg (RENC), Portage Lake (MFS), Prentiss Township T4 R4 (MFS), Presque Isle (MFS), Princeton (MFS), Raymond (PVT), Saint Francis (MFS), Sandwich Academy Grant Township (MFS), Sanford (RPWC), Seboomook Township (MFS), Sidney (RENC), Skowhegan (RENC), Springfield (MFS), Stetson (MFS), Steuben (RENC), Stoneham (RENC), Sumner (MFS), T10 R13 WELS (MFS), T11 R14 WELS (UNH), T11 R7 WELS (MFS), T11 R8 WELS (MFS), T12 R15 WELS (UNH), T12 R15 WELS (UNH), T12 R17 WELS (MFS), T14 R15 WELS (UNH), T14 R7 WELS (MFS), T17 R3 WELS (MFS), T18 R10 WELS (MFS), T2 R4 WELS (MFS), T3 R10 WELS (RENC), T3 R8 WELS (MFS, RENC), T41 MD (MFS), T5 R18 WELS (RPWC), T6 R11 WELSD (UVM), T8 R5 WELS (MFS), T8 R7 WELS (MFS), T8 R8 WELS (MFS), T9 R3 WELS (MFS), Troy (MFS), Unity (MFS), Vienna (RENC), Waterboro (RENC), Waterville (RENC), Wayne (MFS), Weld (MFS), Whitefield (RENC), Whiting (CNC), Winslow (RENC, UNH), Winter Harbor (UNH), Winterville Plantation (MFS).

***Platynus indecentis* Liebherr and Will (Plate 38)**

Habitat: Sphagnum bogs.

Flight dynamics: Fully winged, no light trap records.

Biology: Collected from under bark of dead trees, particularly fallen logs with one end in water, in sphagnum bogs; an adult found on summit of Whiteface Mountain, New York suggests flight capability.

General range: A northeastern species. Northeast to New Brunswick and west to Québec, north to northern Vermont and New York, in Ontario north to Alfred, west to northeastern Ohio (Geauga Co.), south to far western Maryland and Ulster Co., New York.

Maine localities (4): Appleton (RPWC), Belgrade (RENC), Georgetown (UVM), Phippsburg (RENC).

***Platynus mannerheimi* (Dejean) (Plate 39)**

Habitat: In wet areas with sphagnum in conifer forests, mixed forests, and forested bogs.

Flight dynamics: Fully winged, no light trap records.

Biology: Teneral adults appear in July; mating and egg-laying occur in late July. Has been recorded climbing trees.

General range: A circumpolar species. In the Old World, in far northern Europe and the mountains of Scandinavia, across northern Siberia to Pacific Ocean. In the New World, Northeast to Labrador and Newfoundland, in Québec north to Schefferville, in Manitoba north to Hudson Bay at Churchill, in the Northwest Territories north to Ft. Wrigley (62° N on Mackenzie River), in Alaska west to Fairbanks and Anchorage, in British Columbia south to Quesnel, south into Alberta, Minnesota, Wisconsin, and Michigan; in Ontario south to Belleville, in Québec south to Montreal region, in New York in the Adirondacks, in Green Mountains of Vermont, south to Stratton, in New Hampshire in the White Mountains and farther north, an isolated record from northwestern Connecticut.

Maine localities (15): Bangor (UNH), Bar Harbor (UVM), Beddington (MFS), Belgrade (RENC), Chesuncook Township (UNH), Dennysville (UNH), Grafton Township (CNC), Kibby Township (MFS), Nesourdnahunk Township (CNC), Presque Isle (UVM), Roque Bluffs (MFS), T15 R13 WELS (CNC), T6 R7 WELS (MFS), Trout Brook Township (MFS), Winterville Plantation (MFS).

***Platynus tenuicollis* (LeConte) (Plate 39)**

Habitat: Borders of rapid rivers and streams in shaded places under stones, also on open lakeshores.

Flight dynamics: Fully winged, in light trap records.

Biology: Teneral adults appear from late June to mid-August.

General range: An eastern and central North American species. Northeast to Nova Scotia and New Brunswick, in Québec north to Lac St. Jean and Mistassini, in Ontario north to Sault St. Marie and Lake Nipigon, north to Michigan and Minnesota, west to South Dakota, Iowa, Missouri, Arkansas, and Louisiana, south to the Gulf of Mexico and Florida.

Maine localities (16): Appleton (CNC), Bar Harbor (UVM), Batchelders Grant Township (RENC), Camden (UNH), Carrabassett Valley (PVT, UVM), Hancock (CNC), Lebanon (UNH), Lewiston (MFS), Nesourdnahunk Township (CNC), Newry (UVM), Stoneham (RENC), T13 R8 WELS (RENC), Vienna (RENC), Waterboro (RENC), Waterville (RENC).

**Tribe Atranini****Genus *Atranus******Atranus pubescens* (Dejean) (Plate 10)**

Habitat: Beaver houses (adults and larvae) and beaver dams; also in dense plant (flood) debris along rivers.

Flight dynamics: Fully winged, no flight records.

Biology: Nocturnal species.

General range: An eastern North American species.

Northeast to New Brunswick, in Québec north to Lac St. Jean, in Ontario north to Ottawa, northwest to Michigan, west to Iowa, Missouri, and Kansas, south to Texas, Louisiana, and Georgia.

Maine localities (5): Codyville Plantation (RPWC), Fairfield (RENC), Millinocket (MFS), Mount Vernon (MFS, RENC), Orono (CNC).

**Tribe Perigonini****Genus *Perigona******Perigona nigriceps* (Dejean) (Plate 38)**

Habitat: Compost heaps, vegetable refuse, straw and animal enclosures.

Flight dynamics: Fully winged, light trap records.

Biology: Unknown.

General range: An almost cosmopolitan species. In

North America, Northeast to Nova Scotia and New Brunswick, west to Ohio and Arkansas, south to Louisiana and Florida, and isolated in Oregon and California. It is thought to have originated in Southeast Asia or to the islands east of there, possibly New Guinea, but was introduced into North America before 1853.

Maine localities (3): Lebanon (UNH), Mount Vernon (MFS), Waterville (PVT, RENC).

***Perigona pallipennis* (LeConte) (Plate 38)**

Habitat: Under debris at edges of ponds.

Flight dynamics: Fully winged.

Biology: Unknown.

General range: An eastern and central species.

Northeast to Maine, otherwise north to Ontario and Michigan, west to Iowa and Missouri, south to Alabama and Florida.

Maine locality (1): Belgrade (RENC).

**Tribe Odecantini****Genus *Colliuris******Colliuris pensylvanica* (L.) (Plate 26)**

Habitat: Under deciduous bushes on city lots, in gardens, amid low vegetation, especially grasses, and on corn foliage; particularly common in dry, grassy areas, on compact substrates, often associated with smaller ants on which it may prey.

Flight dynamics: Fully winged, and a strong, frequent flier, in light trap records, also in drift along shores of large lakes and stray specimens on mountain tops.

Biology: Adapted to climb in vegetation; a surprisingly fast runner on the ground despite its ungainly appearance.

General range: A widespread east-central species with an apparently isolated population in California. Northeast to central Maine, in Québec north to Lac St. Jean, in Ontario north to Amprior, west of Ottawa and Grand Bend on Lake Huron, north to Michigan and Minnesota, northwest to North Dakota, west to South Dakota, Nebraska, Kansas, Texas, south into Mexico and the Gulf Coast into Florida.

Maine localities (9): Clinton (RENC), Dedham (PVT), Lewiston (MFS), Montville (RENC), Mount Vernon (MFS), Oakland (PVT), Pittston (PVT), Skowhegan (PVT), Waterville (RENC).

**Tribe Cyclosomini****Genus *Tetragonoderus******Tetragonoderus fasciatus* (Haldeman) (record from Majka *et al.* (2011)) (Plate 45)**

Habitat: Dry sandy ground with sparse vegetation, often in agricultural fields and in sand and gravel pits, also on the shores of lakes and rivers but not restricted to sites near water.

Flight dynamics: Fully winged, takes flight when disturbed, and commonly attracted to artificial lights at night; occasionally found in wind-drift material on lake shores.

Biology: Teneral adults appear in late summer (August) and adults overwinter; egg-laying seasonality apparently not known.

General range: Generally in the East, from Florida west to Texas, Arizona and California, but otherwise restricted to east of the Rockies, north to Iowa, Illinois, and Wisconsin, east to Ontario, Pennsylvania, New York, Québec and Maine.

Maine localities (1): Biddeford (PVT).

**Tribe Lebiini****Subtribe Cymindidina****Genus *Cymindis******Cymindis borealis* LeConte (Plate 26)**

Habitat: Dry open areas on sand or clay.

Flight dynamics: Wings dimorphic, fully winged form rare, no flight records.

Biology: Teneral adults emerge from late June through July, gravid females appear in July; overwinters either as larva or adult.

General range: Almost transcontinental, not quite reaching the Pacific Coast. Northeast

to Newfoundland, in Québec north to Lac St. Jean, across the southern prairie provinces north to Edmonton, Alberta, west to Vernon, British Columbia, south along the Rocky Mountains to New Mexico, east of the mountains, south to Minnesota, Wisconsin, Michigan, New York, and Connecticut.

Maine locality (1): Harpswell (MCZ).

***Cymindis cribricollis* Dejean (Plate 26)**

Habitat: Xerophilous, occurring in gravel pits, dry pastures, forest edges, drier parts of deciduous and coniferous forests (especially where there is minimal understory vegetation), and alpine tundra.

Flight dynamics: Dimorphic, no flight records.

Biology: Gravid females appear from June to early August, teneral adults may be found from late June to late August. In late fall, this species is sometimes abundant under stones on south-facing slopes; an autumn breeder, overwinters as both larvae and adults.

General range: A northern transcontinental species with a southward extension in the Rocky Mountains. Northeast to extreme southern Labrador and Newfoundland, in Québec north to Schefferville, in Ontario north to Cochrane, in Manitoba north to Gillam on the Nelson River, in the Northwest Territories north to Ft. Wrigley (63° N), northwest to Whitehorse in the Yukon Territory, in British Columbia, west to Vancouver Island, south to Oregon, Colorado, Arizona, and New Mexico; southern limit east of the Rockies is in South Dakota, Minnesota, Wisconsin, Ohio, Pennsylvania, New Jersey, and New York. In New York, limited to the Adirondacks and nearby lowlands and high parts of the Allegheny Plateau.

Maine localities (28): Anson (RENC), Belgrade (RENC), Brookville (MCZ), Fairfield (RENC), Garland (RENC), Gilead (CNC), Harpswell (MCZ), Isle Au Haut (MCZ), Islesboro (PVT), Kibby Township (MFS), Lee (RPWC), Milbridge (RENC), Mount Desert (PROC), Mount Vernon (MFS), Nesourdnahunk Township (CNC), Portland (MCZ), Rangeley (MCZ), Sidney (RENC), Steuben (UVM), Sweden (CNC), T11 R10 WELS (MFS), T3 R8 WELS (MFS), T4 R10 WELS (CNC), T6 R11 WELS (UVM), Unity (RENC), Washburn (RENC), Waterboro (RENC), Waterville (RENC).

***Cymindis limbata* Dejean (Plate 26)**

Habitat: Arboreal species occurring most often in deciduous forests, but also in pine forests. In New Brunswick, sometimes common in drift material on sea beaches.

Flight dynamics: Fully winged, in light trap records.

Biology: Hides by day under plates of loose bark, can be caught under burlap bags on tree trunks and on sugar baits for moths; rarely caught on the ground except in the spring, when it can be found under leaf litter where it presumably overwinters.

General range: An east-central North American species. Northeast to Nova Scotia and New Brunswick, in Québec north to extreme southwestern region, from Lake Champlain and Chateaugay, to Lake Temiscamingue in the far west, in Ontario north to Petewawa and Grand Bend, north to Michigan and Minnesota, northwest to North Dakota, west to Iowa, Missouri, and Arkansas, southwest to east Texas, south to the Gulf of Mexico and Florida.

Maine localities (8): Auburn (MFS), Belgrade (RENC), Bethel (CNC), Bridgton (MFS), Lovell (MFS), Madison (RENC), Ogunquit (CNC), Skowhegan (MFS).

***Cymindis neglecta* Haldeman (Plate 26)**

Habitat: Dry forest edges or openings in deciduous and coniferous forests, sometimes on steep, wooded slopes. Usually in leaf litter.

Flight dynamics: Dimorphic, estimated that only about 3% are macropterous.

Biology: Teneral adults appear in early June, gravid females in early July. In the Green Mountains of Vermont, found up to 500 m elevation.

General range: An east-central North American species. Northeast to Nova Scotia and New Brunswick, in Québec north to Lac St. Jean and Lac Temiscamingue, in southern Manitoba and Saskatchewan, with a very isolated northwestern record from Upper Hay River Post, in far northern Alberta; west to North Dakota, and Iowa, south to Illinois, Indiana, Ohio, and Virginia.

Maine localities (6): Batchelders Grant Township (RENC), Bethel (CNC), Gilead (CNC), Monmouth (MFS), Mount Desert (PROC), Winslow (RENC).

***Cymindis pilosa* Say (Plate 27)**

Habitat: In dry open fields and on sterile sand and clay in sand and gravel pits.

Flight dynamics: Dimorphic, a third of the population in New Hampshire is long-winged; in light trap records.

Biology: Gravid females appear in early to mid-August; overwinters as larva, teneral adults appear in early June to mid-July. By day, hides under stones, boards, or plant debris.

General range: An east-central North American species. Northeast to western Maine, in Québec along the St. Lawrence beyond Québec City to Kamouraska, in the Montreal area north to

Shawbridge; in Ontario north to Ottawa; north-west to Michigan, Wisconsin and Minnesota, west to North Dakota, South Dakota, Nebraska, and Kansas, southwest to Texas, south to the Gulf States including Georgia but not Florida.

Maine locality (1): Fryeburg (RPWC).

***Cymindis platicollis* (Say) (Plate 27)**

Habitat: An arboreal species, said to favor sandy regions.

Flight dynamics: Fully winged, no flight observations, but found in drift on Lake Erie.

Biology: Unknown.

General range: An east-central North American species. Northeast to southern Maine, in Québec at Mt. St. Gregoire and Iberville, southern Ontario, Michigan, and Wisconsin, west to Iowa, Oklahoma, and Texas, south to the Gulf of Mexico and Florida.

Maine localities (2): Appleton (RPWC), Casco (PVT).

***Cymindis unicolor* Kirby (Plate 27)**

Habitat: Under flat stones in tundra zones.

Flight dynamics: Vestigially winged, but few specimens have been examined.

Biology: Unknown.

General range: A far northern species. Northeast to the northern tip of Labrador and Québec, north to Cornwallis Island, north to Aklavik near the mouth of the Mackenzie River, west to the coast range of British Columbia, south in the Cascades and Sierra Nevada of California., south in the Rockies to Colorado and Utah, south in Ontario to Thunder Bay, in Québec south to the Straits of Belle Isle. Relict high-mountain populations in the Gaspé of Québec, the White Mountains of New Hampshire, and on Mt. Katahdin in Maine.

Maine locality (1): Mt. Katahdin Township (CNC).

**Subtribe Dromiulina**

**Genus *Dromius***

***Dromius piceus* Dejean (Plate 28)**

Habitat: An arboreal species, occurring on both hardwoods and conifers.

Flight dynamics: Fully winged and a day flier; both flight observations and many light trap records.

Biology: General adults appear in late August and early September. Eggs are laid in May and June on tree trunks. Each egg is laid in a depression in the bark and is covered with fragments of algae and bark which the female has previously gathered and carried on the end of its abdomen. The larva is present from June to September. The adult is a tree climber found by day beneath flakes of bark. It is active early in

the night when weather is warm. Adults visit the ground only to hibernate.

General range: A transcontinental species. Northeast to Nova Scotia and New Brunswick, in Québec north to Gaspé, Lac St. Jean and Abitibi, in Ontario north to Lake Nipigon, in Alberta north to Edmonton, in British Columbia north to Terrace and west to Vancouver Island, virtually throughout the contiguous USA except not yet recorded from Florida, Nevada, or Utah.

Maine localities (52): Ashland (MFS), Auburn (MFS), Baileyville (MFS), Bar Harbor (PROC), Bradley (MFS), Bridgton (MFS), Brunswick (MFS), Bucksport (MFS), Charlotte (MFS), Crystal (MFS), Dallas Plantation (MFS), Dedham (MFS), Dover-Foxcroft (MFS), Enfield (MFS), Frenchtown Township (MFS), Harrington (UVM), Herseytown Township (MFS), Kennebunk (MFS), Knox (MFS), Lebanon (UNH), Long A Township (MFS), Marion Township (MFS), Millinocket (MFS), Monmouth (MFS), Morrill (MFS), Mount Desert (PROC), Mount Vernon (MFS), Orono (MFS), Orrington (MFS), Perry (MFS), Phippsburg (RENC), Portage Lake (MFS), Richardsontown Township (MFS), Robbinston (MFS), Rome (RENC), South Bristol (MFS), T11 R11 WELS (MFS), T13 R8 WELS (MFS), T15 R6 WELS (MFS), T17 R4 WELS (MFS), T2 R10 WELS (MFS), T2 R4 WELS (MFS), T3 R11 WELS (MFS), T3 R7 WELS (MFS), T30 MD BPP (MFS), T4 Indian Purchase Township (MFS), T4 R10 WELS (MFS), T8 R3 WELS (MFS), TD R2 WELS (MFS), Township C (MFS), Waterville (RENC).

**Genus *Axinopalpus***

***Axinopalpus biplagiatus* (Dejean) (Plate 10)**

Habitat: Hillsides and pastures in dry, open habitat, usually taken under stones, sometimes taken on flowers.

Flight dynamics: Fully winged, taken at light traps.

Biology: Sometimes gregarious (as many as 100 under one stone).

General range: Transcontinental. Northeast only to southern Maine, in Québec north to Montreal, along the St. Lawrence River to Québec City, but not recorded from the eastern townships, in Ontario north to Ottawa, in southern Saskatchewan, Alberta and British Columbia, west to Vancouver Island. Also found in Washington, Oregon, and California, south to Arizona and New Mexico, in the central plains south to Kansas and Missouri, in the east, south to Alabama and Florida.

Maine localities (2): Monmouth (CNC), York (PVT).

**Genus *Apristus******Apristus latens* (LeConte) (Plate 10)**

**Habitat:** On dry sand with little or no vegetation, not necessarily near water; often on lakeshore sand dunes.

**Flight dynamics:** Fully winged, apparently no flight records.

**Biology:** Unknown.

**General range:** Predominantly a Great Plains species with some eastern records. Northeast to Cape Breton and New Brunswick, near Hull, Québec, Point Pelee in Ontario, north to Manitoba, northwest to Montana, west to Colorado and New Mexico, south to Texas, Alabama. Isolated records from Massachusetts, Maryland, and Virginia.

**Maine localities (1):** T3 R8 WELS (MFS).

***Apristus subsulcatus* (Dejean) (Plate 10)**

**Habitat:** In dry, gravel and sand along rivers and lakes, sometimes in gravel (with or without sand) away from water bodies.

**Flight dynamics:** Fully winged, flight has been observed, but this species has not been taken at light traps.

**Biology:** Teneral adults appear in August; the species is at least partly diurnal.

**General range:** An eastern mid-latitude species. Northeast to Cape Breton Island and New Brunswick, in Québec north to Rimouski, in Ontario north to Ottawa, northwest to Michigan, west to Wisconsin and Illinois, south to Indiana, Ohio, and Virginia.

**Maine localities (6):** Anson (CNC), Columbia Falls (CNC), Northeast Carry Township (RPWC), Skowhegan (RENC), T10 R7 WELS (MFS), T3 R8 WELS (MFS).

**Genus *Microlestes******Microlestes linearis* (LeConte) (Plate 35)**

**Habitat:** Under stones in dry, open fields.

**Flight dynamics:** Dimorphic, no flight records.

**Biology:** Observed active by day in dry soil, hibernates as adult.

**General range:** A northern transcontinental species, absent from southeastern states. Northeast to Nova Scotia, in Québec north to Lac Megantic and Labelle, near Mt. Tremblant, north to Brandon, Manitoba, in Saskatchewan north to Battleford, west to the Pacific Ocean in British Columbia, Washington, Oregon and California, south to Arizona, Colorado, North Dakota, Arkansas, Illinois, Ohio, Pennsylvania, and Virginia.

**Maine localities (2):** Bristol (CNC), Columbia Falls (RENC).

**Genus *Syntomus******Syntomus americanus* (Dejean) (Plate 45)**

**Habitat:** Bare soil, gardens, fields, lawns, pastures, roadsides, gravel pits, among grassy tufts or on mosses on rock ledges, in worn sunny spots in forests, among tundra vegetation, especially dry heaths.

**Flight dynamics:** Wings dimorphic, no light trap records but the macropterous form has been taken on lakeshore drift material.

**Biology:** This is a diurnal species often seen running over bare ground; teneral adults appear in August to early September; overwinters as an adult.

**General range:** A transcontinental species. Northeast to Newfoundland and Labrador, in Québec north to James Bay, in Ontario north to Lake Nipigon, in the Northwest Territories north to Yellowknife, in Alaska north to Circle and west to Denali National Park, in British Columbia west to Vancouver Island, south into Washington and Oregon, Utah, and Arizona, east to New Mexico and Texas; farther east south only to Nebraska, Iowa, Illinois, Ohio, Pennsylvania, and Virginia.

**Maine localities (34):** Alfred (RENC, RPWC), Augusta (UNH), Bar Harbor (PROC), Belgrade (RENC), Carrabassett Valley (PVT), Columbia Falls (CNC), Deer Isle (RENC), Dennysville (MFS), Fairfield (RENC), Fryeburg (RPWC), Gilead (RENC), Isleboro (PVT), Kibby Township (MFS), Lebanon (UNH), Lewiston (MFS, UVM), Lubec (RENC), Lyman (RENC), Mayfield Township (RENC), Moscow (RENC), Parsonsfield (CNC), Prentiss Township T4 R4 (MFS), Riley Township (UVM), Rockport (MFS), Salem Township (RENC), Sanford (RPWC), Smithfield (RENC), Steuben (UVM), T2 R4 WELS (CNC), T2 R9 WELS (MFS), T3 R8 WELS (MFS), T6 R11 WELS (UVM), Topsham (RENC), Waterboro (RENC), Waterville (RENC).

**Subtribe *Lebiina*****Genus *Lebia******Lebia atriventris* Say (Plate 33)**

**Habitat:** Forest edges and clearings, hedgerows, on bushes.

**Flight dynamics:** Fully winged, frequent flier, light trap records.

**Biology:** The larva is a parasitoid on the pupa of the leaf beetle *Zygogramma suturalis* F. (Chrysomelidae), which feeds on goldenrod and ragweed. The adult *L. atriventris* is also found on these plants. Gravid females may be encountered in mid-June.

**General range:** An eastern central species. Northeast to central Maine, in Québec north to Kamouraska Co. and Lac St. Jean, in Ontario north to Ottawa and Grand Bend on Lake Huron, northwest to Saskatoon, Saskatchewan, west to Billings, Montana, eastern Nebraska, Kansas, Oklahoma, Texas, and eastern New Mexico, south to Mexico and the Gulf Coast but absent from Florida Peninsula.

**Maine localities (6):** Augusta (UNH), Monmouth (UNH), Mount Vernon (MFS), Paris (CNC), South Berwick (MFS), Vassalboro (UNH).

***Lebia fuscata* Dejean (Plate 33)**

**Habitat:** Forest edges and clearings, sand pits.

**Flight dynamics:** Fully winged, day flier, light trap records at dusk.

**Biology:** Host unknown.

**General range:** A nearly transcontinental species but absent from the Great Plains and the southwest. Northeast to Nova Scotia and New Brunswick, in Québec north to Témiscouata, Lac St. Jean, and Abitibi, in Ontario north to Sudbury, north to southern Manitoba. Eastern population west to Minnesota, eastern Nebraska, Kansas, eastern Texas, south to the Gulf of Mexico and to the Florida Keys. There is also a western population from southwestern British Columbia including Vancouver Island, western Washington, Oregon, and California south to Santa Cruz County, as well as an isolated record from the Bear Paw Mountains of Montana.

**Maine localities (27):** Amherst (MFS), Augusta (UNH), Bar Harbor (PROC), Belgrade (RENC), Castine (MFS), Eddington (MFS), Enfield (MFS), Fairfield (RENC), Greenville (MFS), Jim Pond Township (MFS), Kennebunk (MFS), Lincoln (UNH), Mapleton (MFS), Mariaville (MFS), Mount Vernon (MFS, RPWC), New Canada (MFS), Oxbow Plantation (MFS), Smithfield (RENC), South Berwick (MFS), Squapan Township (MFS), T32 MD (MFS), Topsfield (MFS), Warren (MFS), Waterville (RENC), Winthrop (MFS), Woodland (UNH).

***Lebia grandis* Hentz (Plate 33)**

**Habitat:** Mostly agricultural lands, suburban landscapes. Adults may be found in late summer in the flowers of goldenrod.

**Flight dynamics:** Fully winged, in light trap records.

**Biology:** Believed to be principally a parasitoid of the Colorado potato beetle, *Leptinotarsa decemlineata* (Say) (Chrysomelidae), but likely attacks related hosts as well.

**General range:** Pronouncedly eastern, ranging west to western Texas and south into Mexico, north through Kansas and Nebraska to South Dakota,

east to southern Ontario and southern Québec (Rigaud), from central Maine, New Hampshire, and Vermont, south to Georgia and Mississippi.  
**Maine locality (1):** Mount Vernon (MFS).

***Lebia lobulata* LeConte (record from Majka et al. (2011)) (Plate 34)**

**Habitat:** Dryish ground in open fields or discontinuous forest.

**Flight dynamics:** Fully winged; occasionally attracted to artificial lights at night

**Biology:** Overwinter as adults, which may be found on a year-round basis. Egg-laying seasonality apparently not known.

**General range:** In the East, from Florida west to Texas, north to Pennsylvania, Ontario, New York, and Maine.

**Maine localities (1):** Cherryfield (PVT).

***Lebia moesta* LeConte (Plate 34)**

**Habitat:** Forest edges and clearings.

**Flight dynamics:** Fully winged, no flight records.

**Biology:** Common on goldenrod in the fall.

**General range:** A northern transcontinental species. Northeast to Labrador, in Québec north to Abitibi district, in Ontario north to Lake Nipigon, in Saskatchewan north to Swift Current, in Alberta north to McMurray, in British Columbia north only to Salmon Arm, west to Vancouver Island, south to western Washington, Idaho, Montana, Minnesota, Illinois, Michigan, New Jersey, New York, and Rhode Island.

**Maine localities (7):** Bar Harbor (PROC), Mount Desert (PROC), Northport (RPWC), Orono (MFS), Sidney (RENC), T14 R6 WELS (MFS), Waterville (RENC).

***Lebia ornata* Say (Plate 34)**

**Habitat:** Common on goldenrod along fence rows, fields, and forest edges.

**Flight dynamics:** Fully winged, common at light traps.

**Biology:** General adults appear in late September; host unknown.

**General range:** An eastern and central species. Northeast to Nova Scotia and New Brunswick, in Québec to Saguenay and Lac St. Jean, northwest to Duluth, Minnesota, west to South Dakota, Nebraska, and Kansas, southwest to Victoria, Texas, south to Gulf of Mexico and in Florida to the Myakka River.

**Maine localities (6):** Bar Harbor (PROC), Biddeford (PVT), Lebanon (UNH), Mount Vernon (MFS, RENC), Naples (CNC), Orrington (RENC).

***Lebia pumila* Dejean (Plate 34)**

**Habitat:** Forest edges and clearings, on goldenrod in the fall, also running on clay soil with lichens,

or under dead leaves beneath alders (*Alnus* spp.; Betulaceae).

**Flight dynamics:** Fully winged, in light trap records, day flier.

**Biology:** Gravid females occur in late June, may be found abundant on flowers of *Origanum vulgare* L. (Lamiaceae) in July and early August.

**General range:** An eastern and central species with an isolated population in Puget Sound, Washington. Northeast to Nova Scotia and New Brunswick, in Québec north to Lac St. Jean and Abitibi, in Ontario north to James Bay, north to vicinity of Prince Albert, Saskatchewan, northwest to Medicine Hat, Alberta, west to western South Dakota and Kansas, south to Brownsville, Texas, to the Gulf of Mexico and the Florida Peninsula, south to Fort Myers; an isolated western population at Hope, in southwestern British Columbia, and southwards in Washington to Olympia.

**Maine localities (10):** Augusta (UNH), Bar Harbor (PROC), Columbia Falls (CNC), Gilead (UNH), Grafton Township (UNH), Hiram (CNC), Mount Vernon (RENC), Southwest Harbor (PROC), T3 R11 WELS (RENC), Weld (CNC).

#### ***Lebia solea* Hentz (Plate 34)**

**Habitat:** Forest edges and clearings, also in dense weeds in gardens.

**Flight dynamics:** Fully winged, day flier, frequent at light traps.

**Biology:** Common on goldenrod flowers, has been found on leaves of field corn. Host unknown.

**General range:** An eastern central species. Northeast to Nova Scotia, in Québec north to Troix Rivieres and to Lake Nominique, in southern Manitoba and Saskatchewan, west to Swift Current, west to central North Dakota, extreme eastern Colorado and the eastern third of Texas, south to the Gulf of Mexico and Homestead in southern Florida.

**Maine localities (6):** Augusta (UNH), Fairfield (RENC), Lebanon (UNH), Mount Vernon (MFS), Vassalboro (UNH), Waterville (PVT).

#### ***Lebia tricolor* Say (Plate 34)**

**Habitat:** Forest edges, clearings, open fields, and meadows, all elevations including the summit of Mt. Washington, New Hampshire.

**Flight dynamics:** Fully winged, in light trap records.

**Biology:** Commonly found on goldenrod flowers; host unknown.

**General range:** An eastern and central species. Northeast to Nova Scotia and New Brunswick, in Québec north to Ile d'Orleans and Hull, southern Ontario, west to Michigan. Wisconsin,

Minnesota, southwest to Iowa, Arkansas, Texas, south to the Gulf Coast and the Florida Peninsula to Tampa.

**Maine localities (5):** Augusta (UNH), Brunswick (MFS), Lebanon (UNH), Lewiston (MFS), Mount Vernon (MFS).

#### ***Lebia viridipennis* Dejean (Plate 34)**

**Habitat:** Unknown. One specimen from Maine was collected from leaf litter in an alder swamp.

**Flight dynamics:** Fully winged, in light trap records.

**Biology:** Unknown.

**General range:** An eastern and central species, found from Maine in the northeast, west through New Hampshire, Vermont, and southern Ontario to Manitoba, Saskatchewan, and North Dakota, south through Nebraska and eastern Colorado to Texas and the Gulf Coast, eastwards to Florida.

**Maine localities (2):** Mount Vernon (MFS), Sanford (RPWC).

#### ***Lebia viridis* Say (Plate 34)**

**Habitat:** Forest edges, open fields, and shrubs. Often found on flowers in the fall.

**Flight dynamics:** Fully winged, day flight observations, in light trap records.

**Biology:** Teneral adults appear in September, common on goldenrod flowers and under the roots, also reported from strawberry flowers and evening primrose (*Oenothera* L.; Onagraceae) and shrub alders (*Alnus rugosa* (Du Roi) Spreng.); probable host is green flea beetles (*Altica* Geoffroy). Overwinters as adults in leaf litter in deciduous forests.

**General range:** A transcontinental species. Northeast to Nova Scotia and New Brunswick, in Québec north to Gaspé and Abitibi, in Ontario north to Sudbury, in southern Manitoba and Saskatchewan, in the Northwest Territories north to Ft. Simpson, in Yukon at Rampart House, north of the Arctic Circle, west to the Pacific Coast and British Columbia including Vancouver Island, west to Washington, Oregon, California, south to Arizona, New Mexico, Texas, Gulf Coast, and the Florida Peninsula.

**Maine localities (39):** Allagash (UNH), Auburn (RPWC), Augusta (MFS, RENC), Bar Harbor (PROC), Beaver Cove (RENC), Belgrade (RENC), Benton (MFS), China (CNC), Dedham (MFS), Enfield (MFS), Fairfield (RENC), Farmington (UNH), Gardiner (CNC), Harrington (UVM), Kennebunk (MFS), Lewiston (MFS), Marion Township (MFS), Millinocket (MFS), Monmouth (RENC), Monson (MFS), Mount Vernon (MFS, RENC), Norway (UNH), Oakland (RENC), Orrington (RENC),

Skowhegan (PVT), Smithfield (RENC), Sumner (CNC), T3 R11 WELS (RENC), T4 R10 WELS (CNC), T8 R5 WELS (CNC), Topsfield (UNH), Topsham (MFS), Vassalboro (MFS), Vienna (RENC), Waldoboro (PVT), Waterboro (RENC), Waterville (RENC), Winslow (PVT), York (PVT).

***Lebia vittata* (F.) (Plate 34)**

Habitat: Gravel pits with willows and alders.

Flight dynamics: Fully winged, diurnal, light trap records.

Biology: Host species is the flea beetle *Disonycha alternata* (Illiger) (Chrysomelidae).

General range: A transcontinental species. Northeast to Nova Scotia, in Québec north to Portneuf and Nominigüe, in Manitoba north to Lake Winnipeg, in Alberta north to Edmonton, west to the Pacific Coast in British Columbia, Washington, Oregon, and California, south to Arizona, New Mexico, Texas, the Gulf Coast, and Florida.

Maine localities (4): Bar Harbor (UVM), Mount Desert (PROC, UNH), Mount Vernon (MFS), Washington (MFS).

**Subtribe *Calleidina***

**Genus *Calleida***

***Calleida punctata* LeConte (Plate 21)**

Habitat: Among dense herbaceous plants, e.g., in gardens or meadows, or among tall weeds in waste places, on roadsides.

Flight dynamics: Fully winged, flight observations, day flier.

Biology: Diurnal, a good climber, sometimes found on goldenrod.

General range: An eastern species. Northeast to Maine, in Québec north on the St. Lawrence River to Port-au-Saumon, and to Hull on the Ottawa River, northwest to southern Manitoba, North and South Dakota, southwest to Texas, south to the Gulf of Mexico and Florida.

Maine localities (17): Augusta (MFS), Baldwin (CNC), Belgrade (RENC), Biddeford (MFS), Bowdoinham (PVT), China (CNC), Corinna (RENC), Fairfield (RENC), Lewiston (MFS), Mount Vernon (MFS), Palermo (PVT), Smithfield (RENC), Sumner (CNC), Unity (RENC), Waterville (RENC), Wilton (CNC), Winslow (PVT).

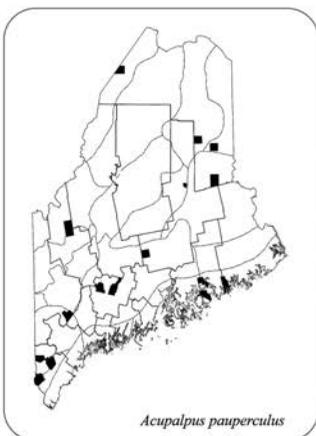
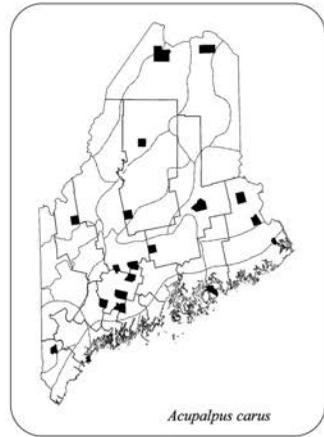


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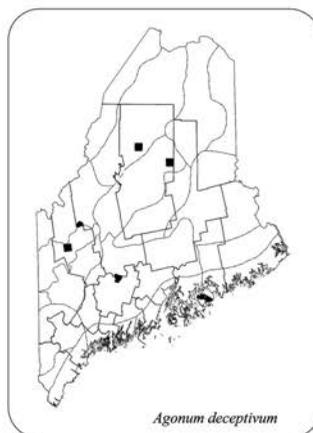
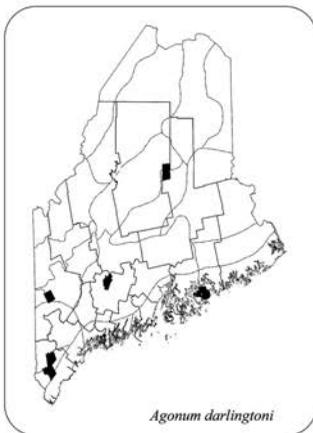
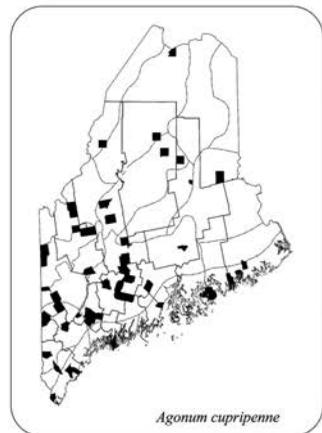
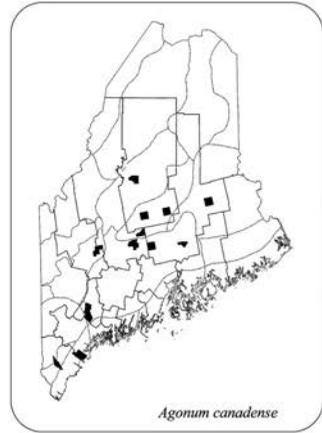
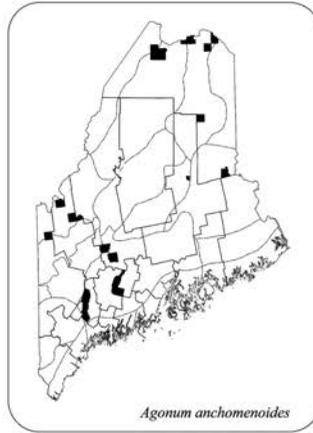
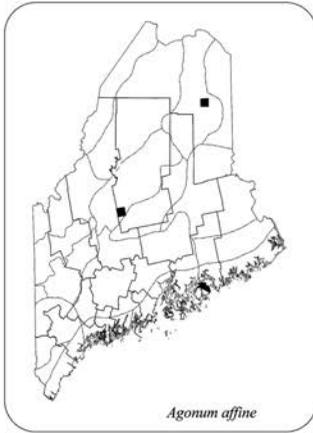


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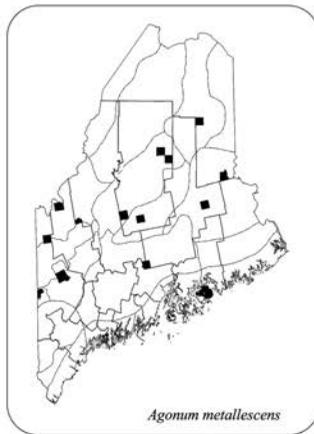
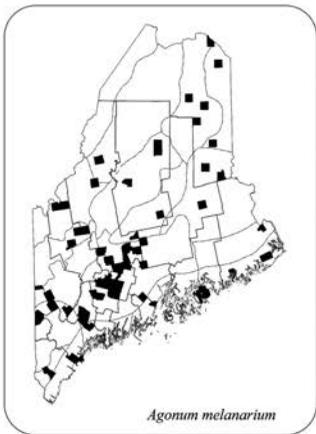
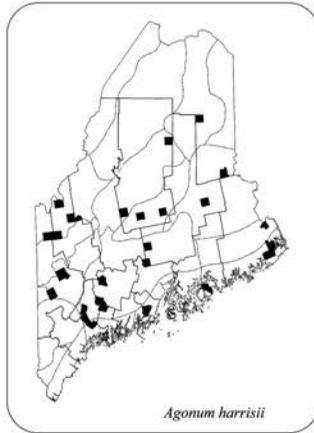
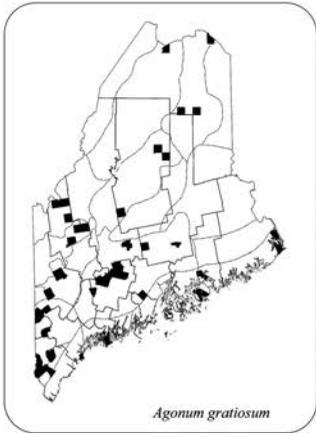
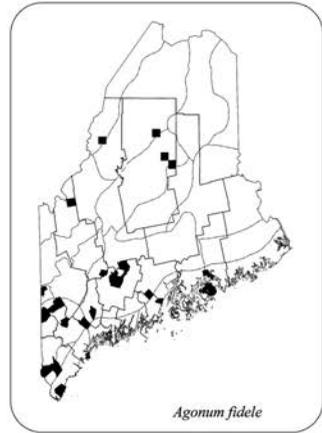
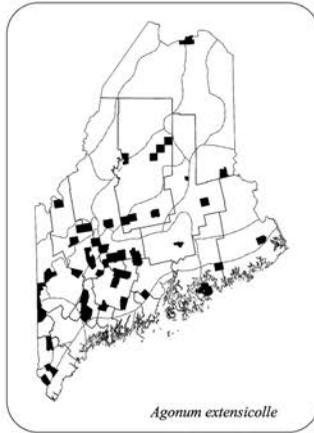
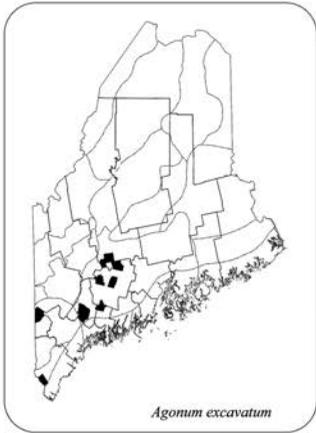


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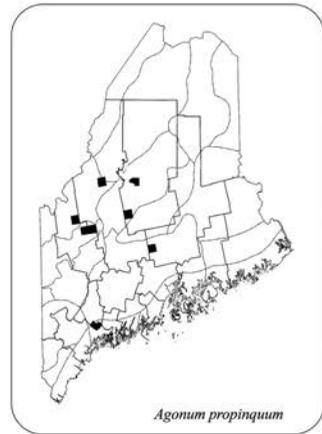
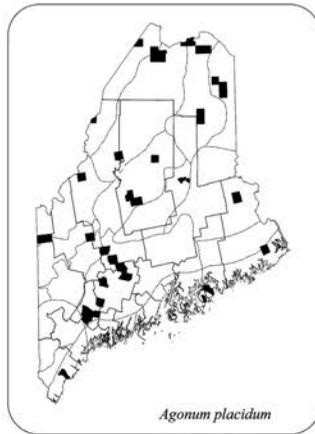
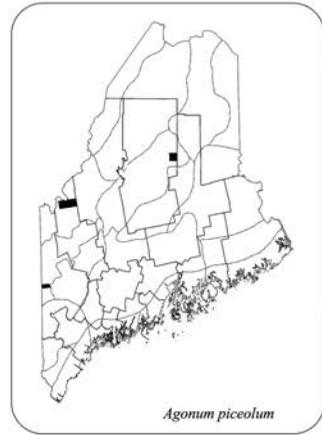
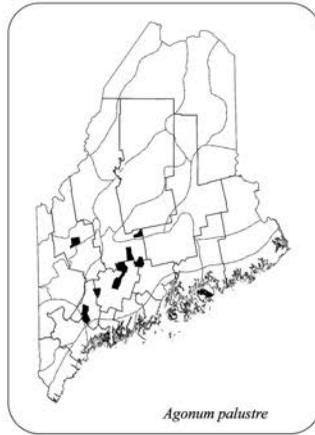
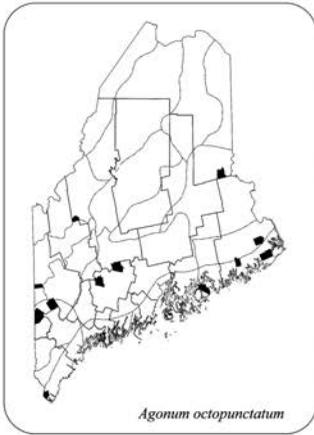
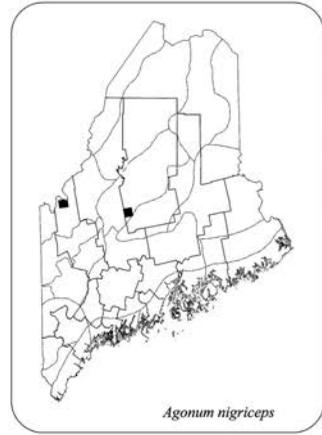
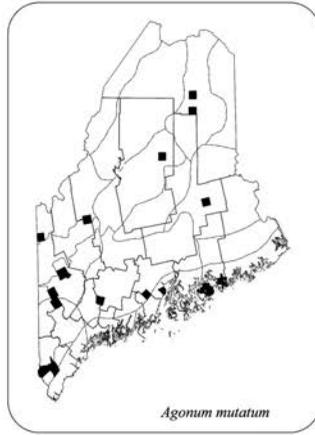
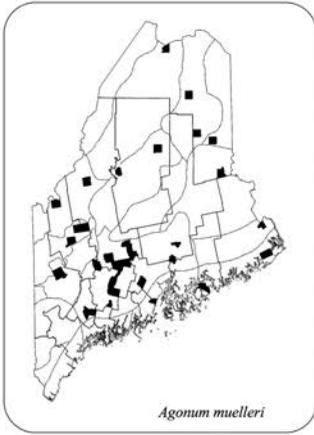


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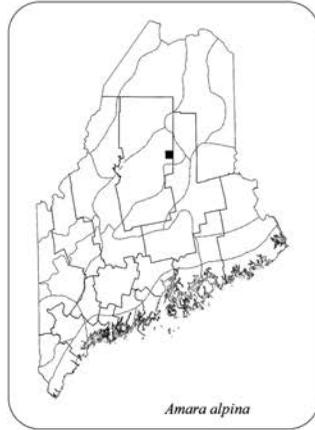
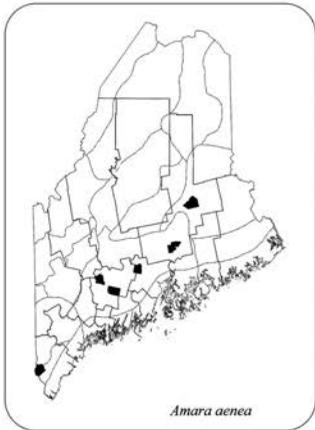
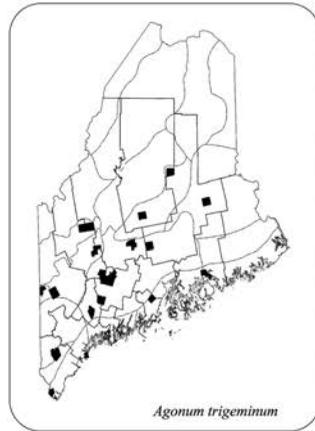
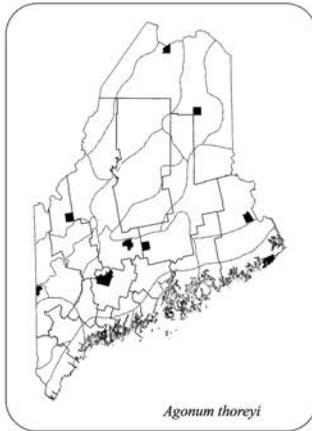
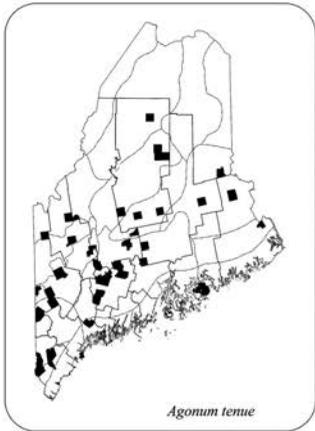
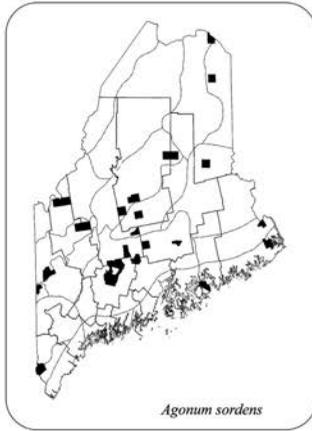


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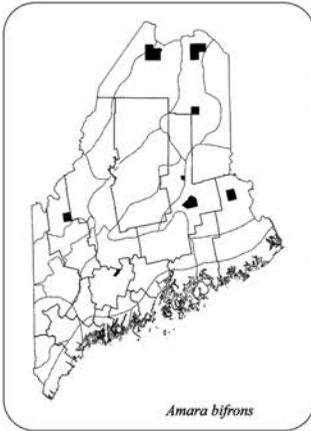
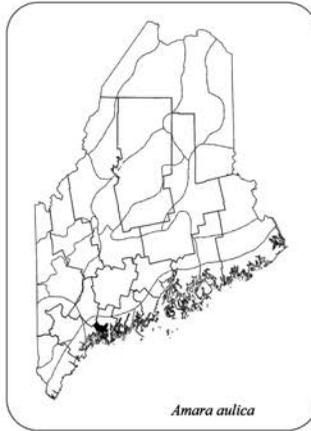
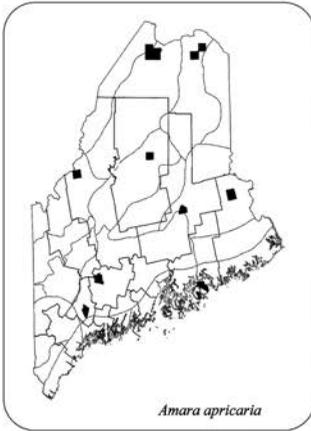
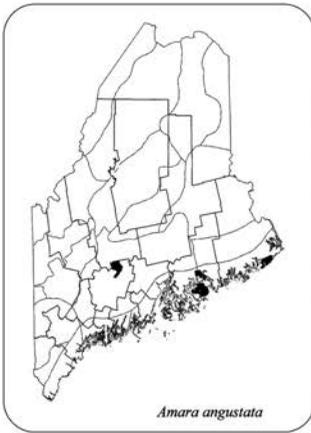


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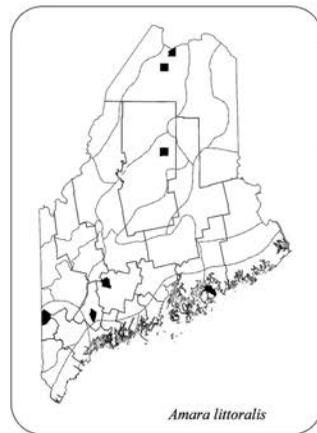
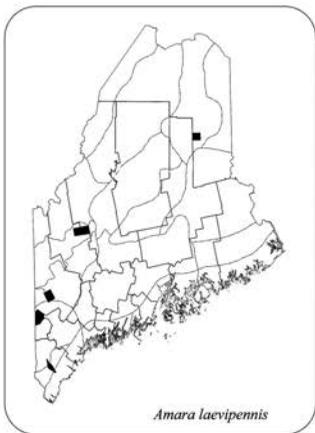
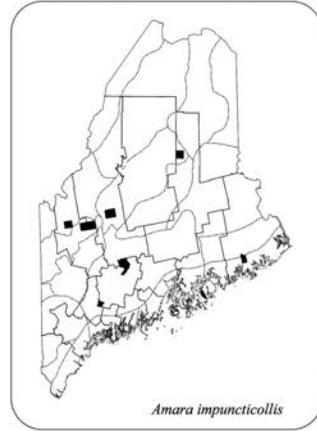
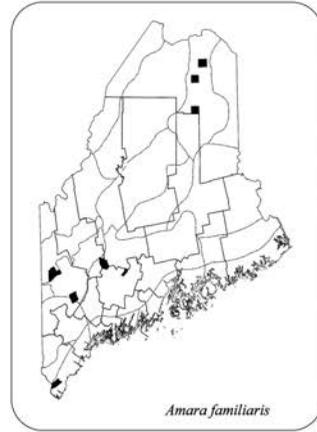
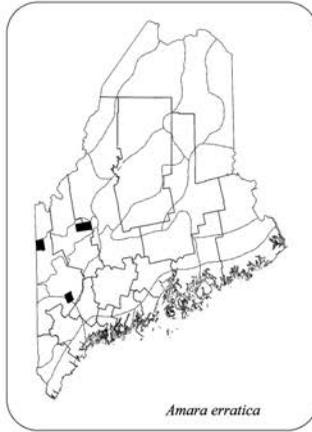
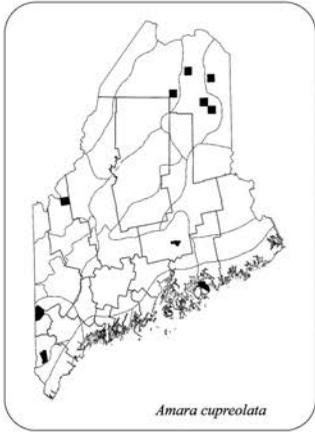


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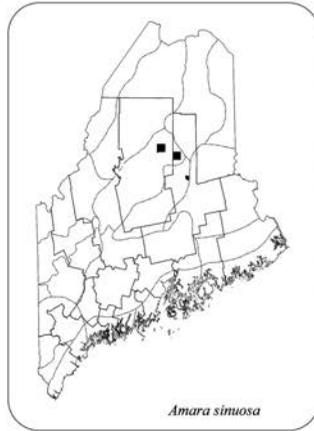
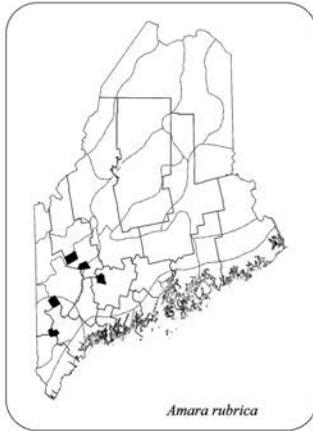
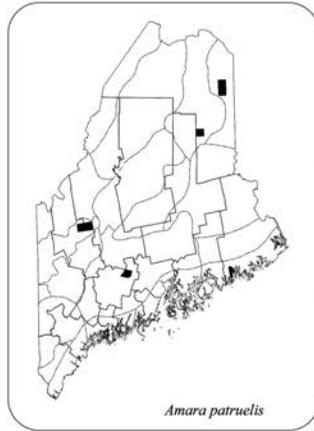
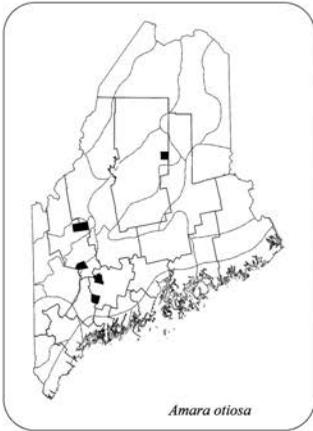
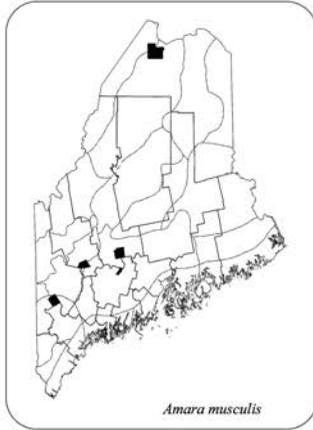


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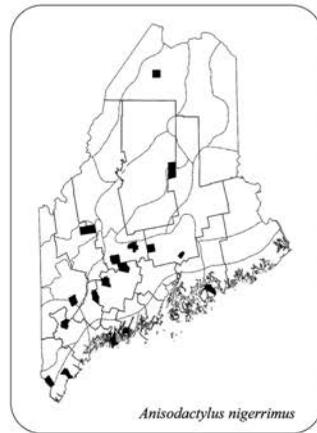
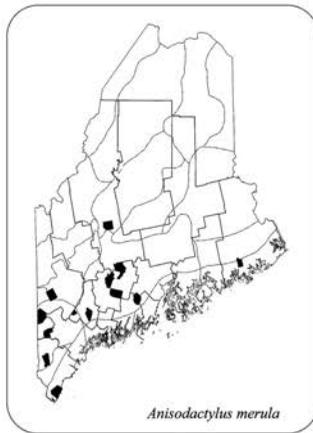
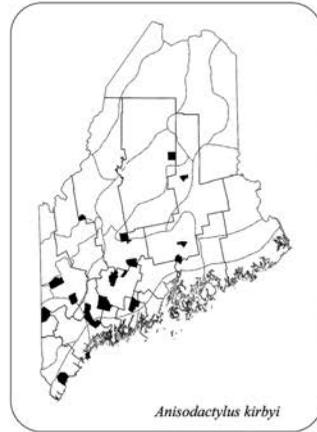
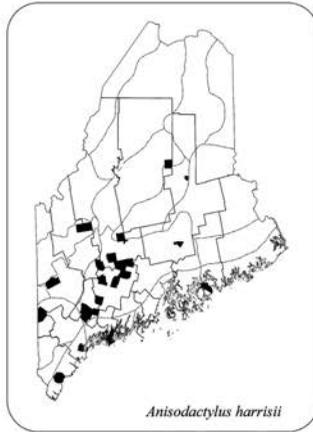


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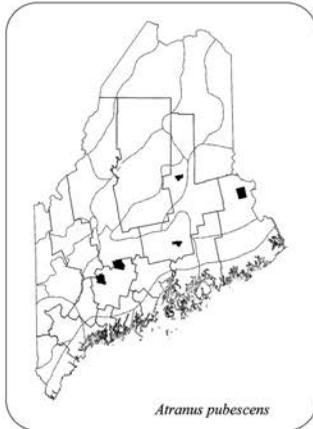
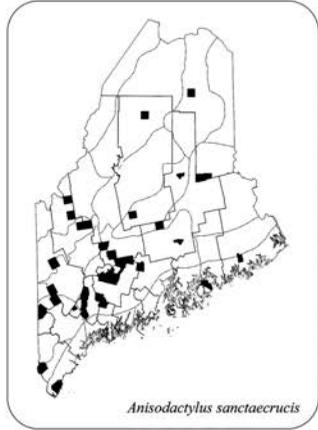
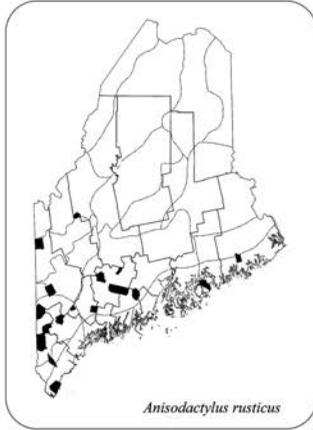
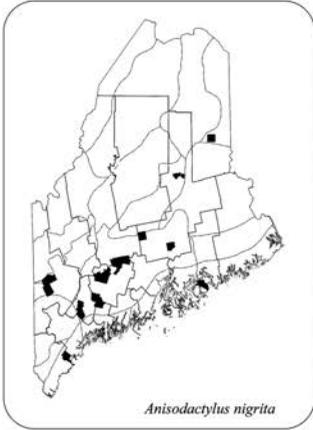


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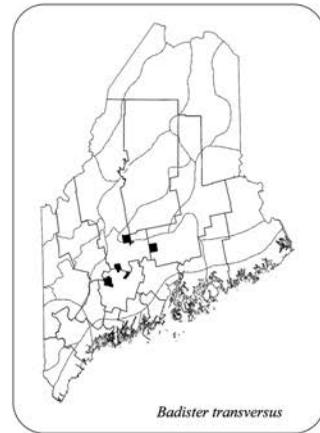
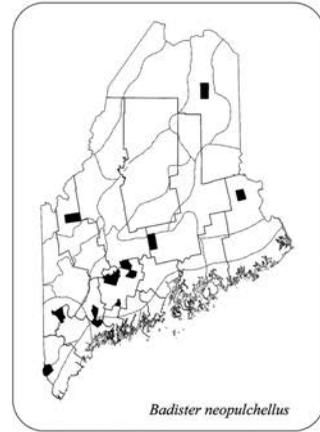
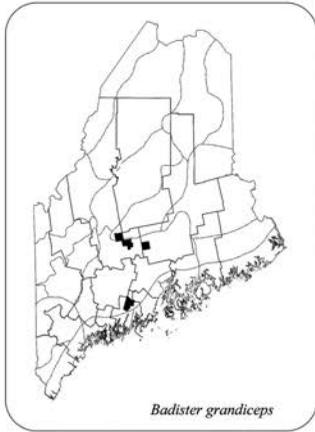


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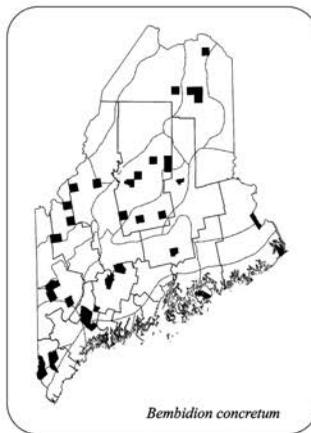
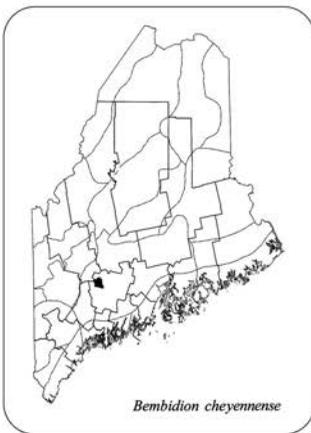
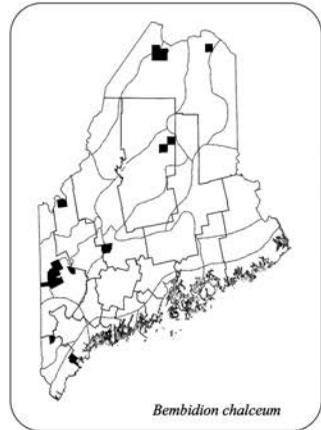
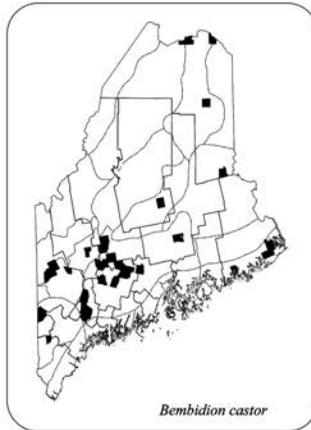
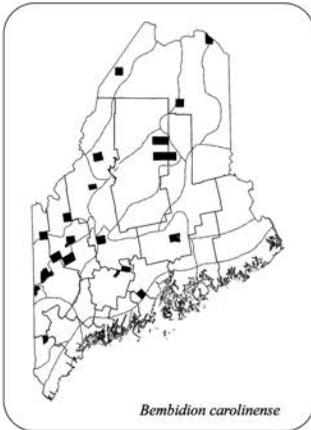
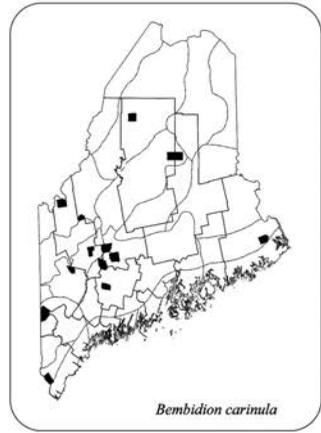
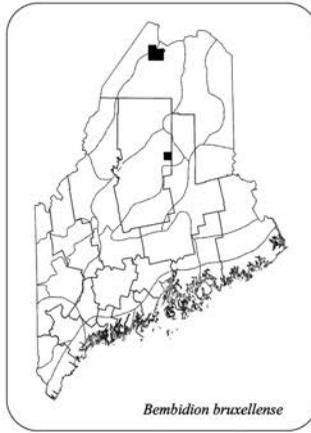


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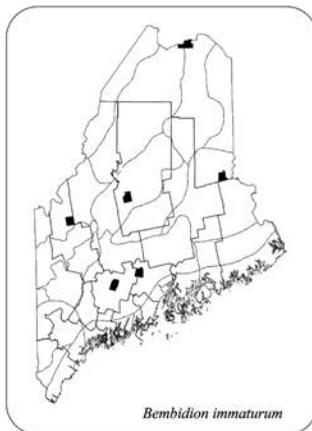
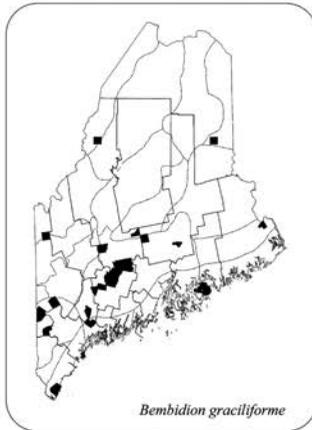
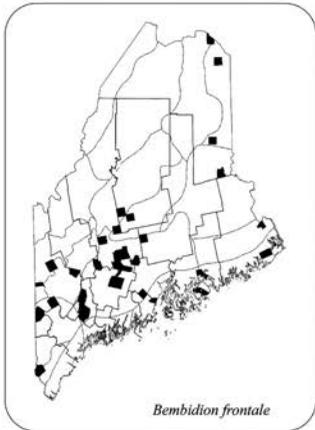
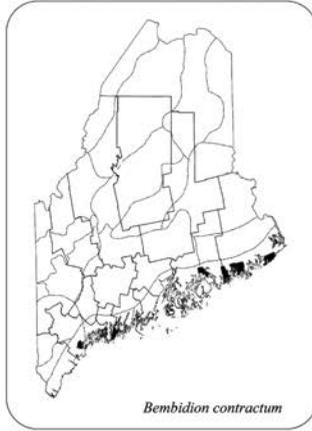


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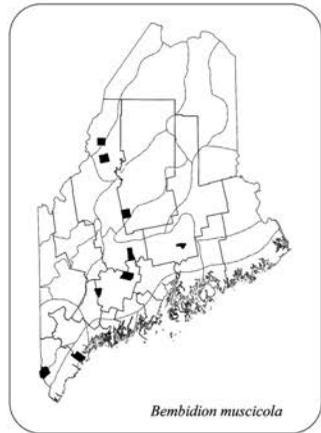
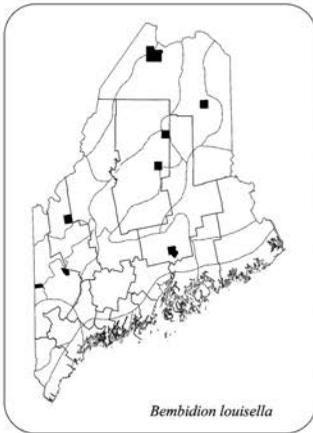
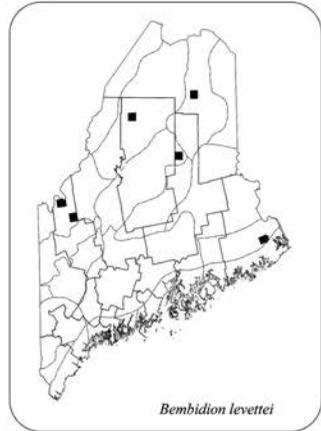
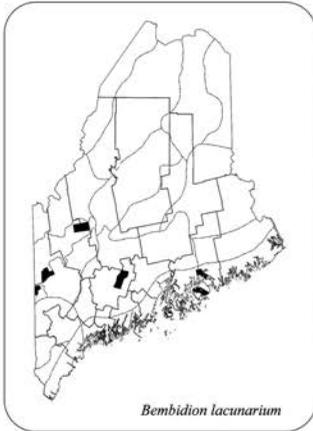
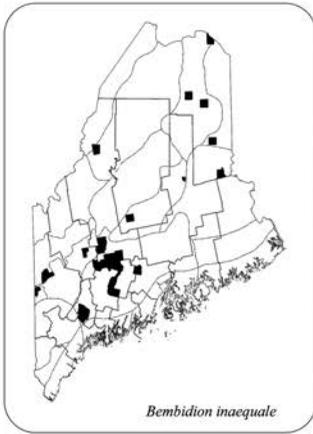


Plate 14

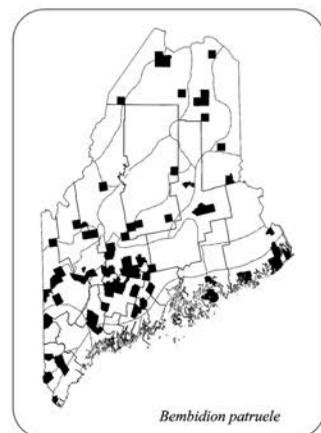
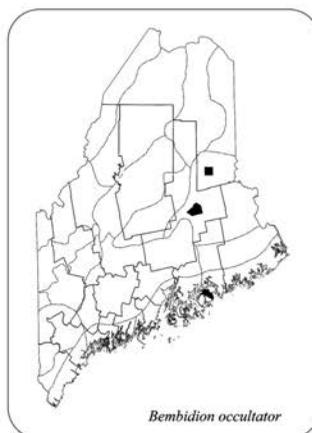
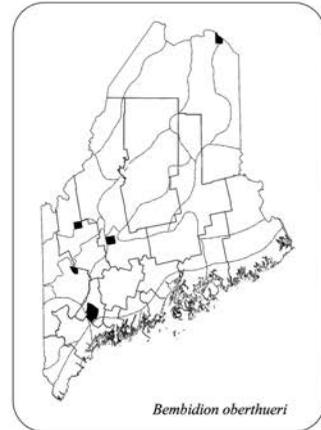
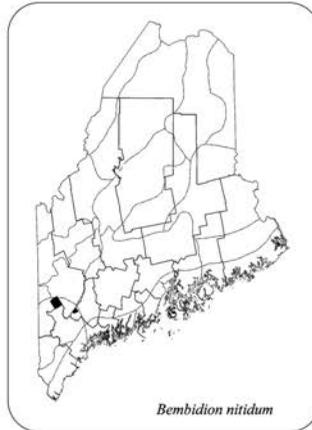
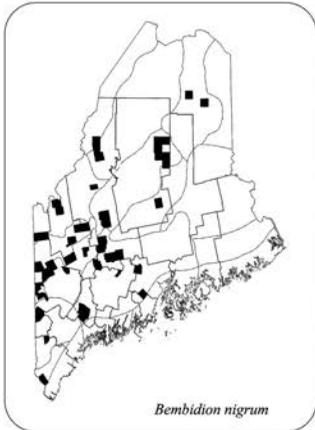


Plate 15

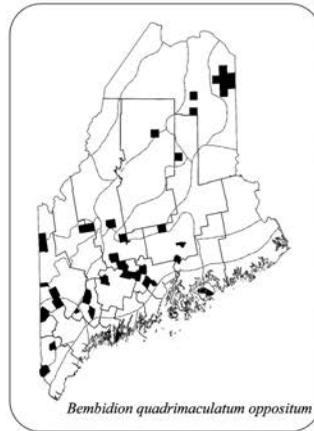
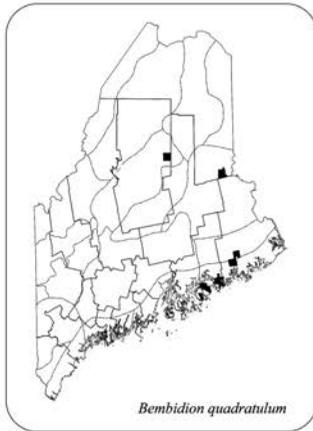
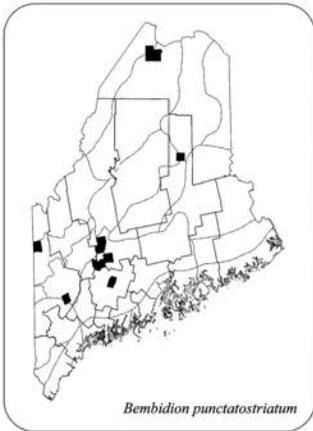
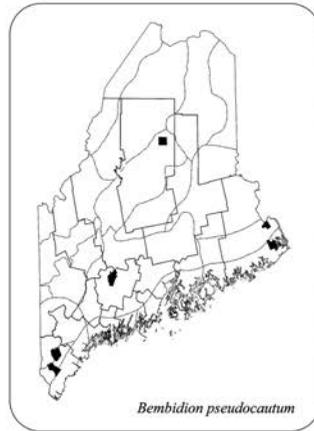
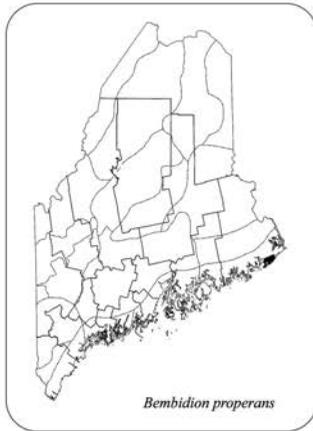
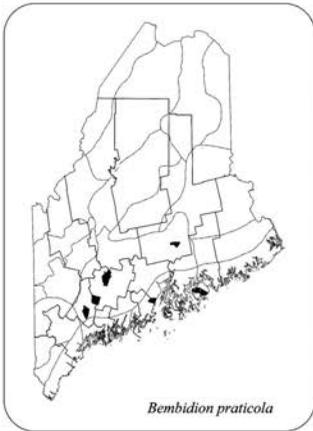
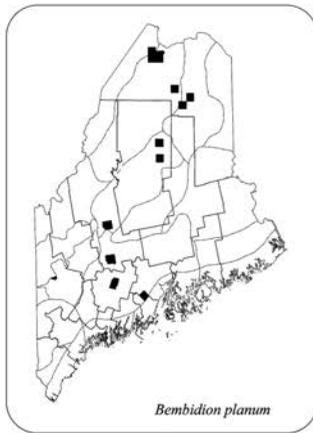


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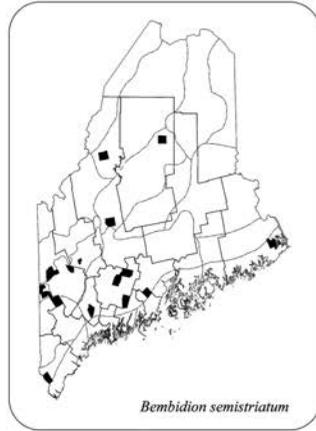
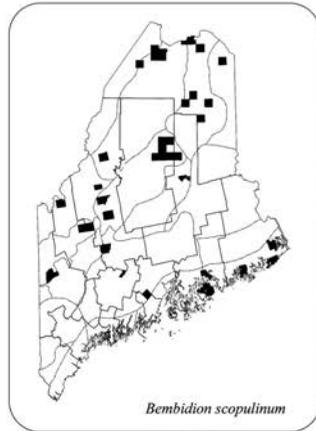
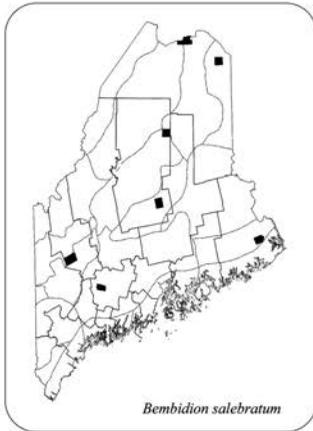
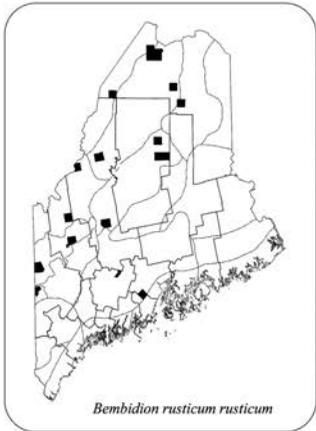
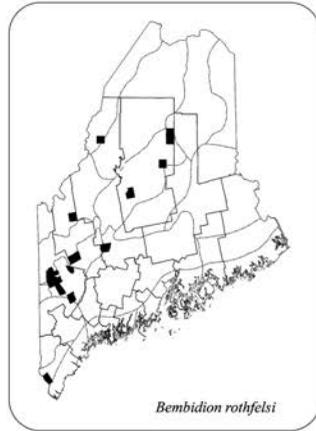


Plate 17

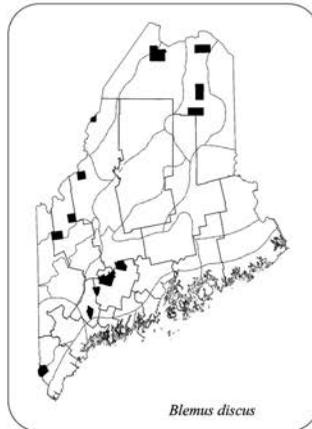
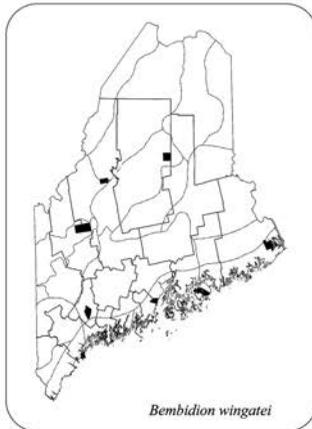
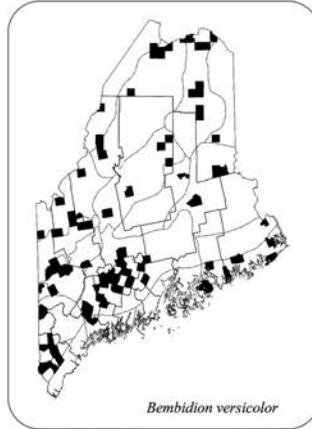
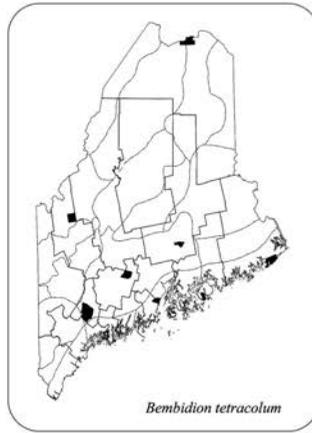
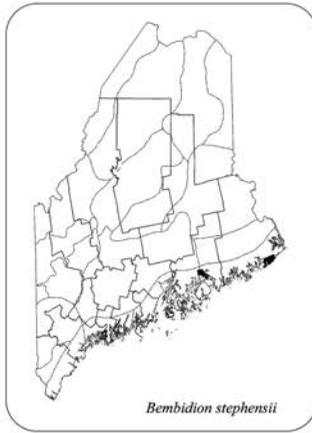


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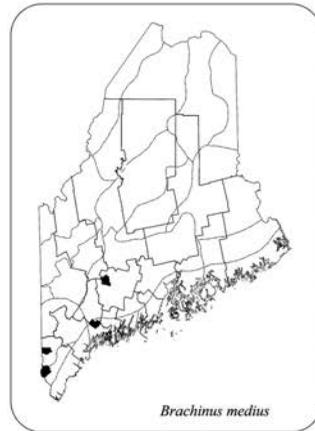
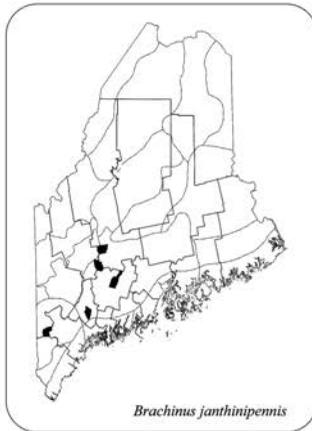
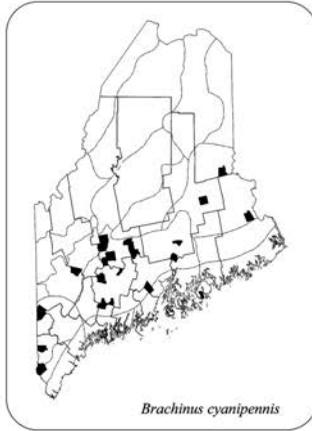
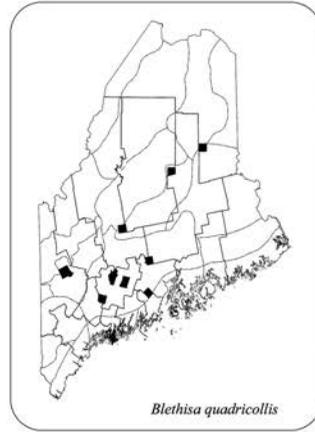


Plate 19



*Brachinus ovipennis*



*Brachinus patruelis*



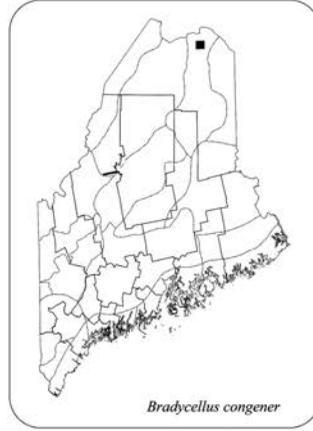
*Brachinus vulcanoides*



*Bradycellus atrimeus*



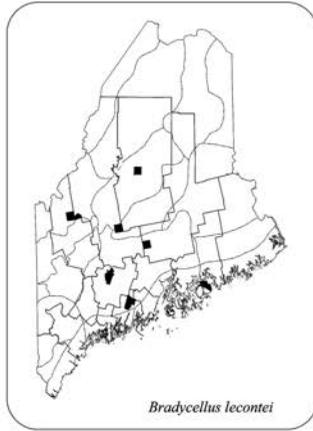
*Bradycellus badipennis*



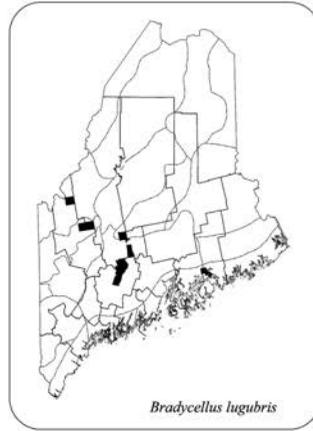
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*Bradycellus kirbyi*



*Bradycellus lecontei*



*Bradycellus lugubris*

Plate 20

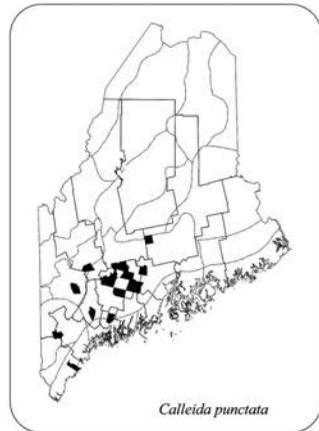
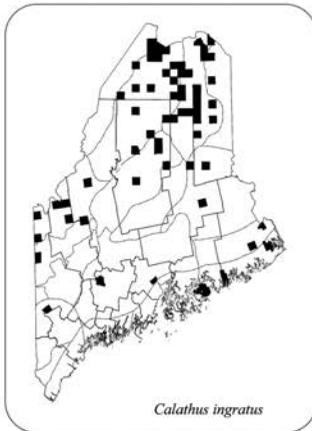
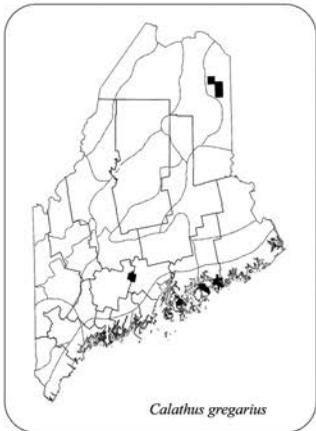
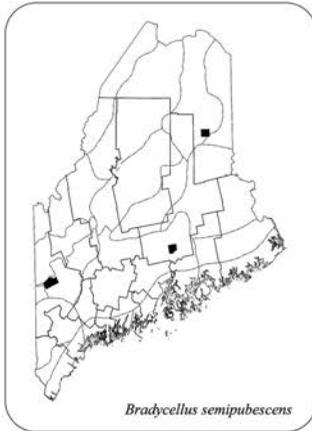
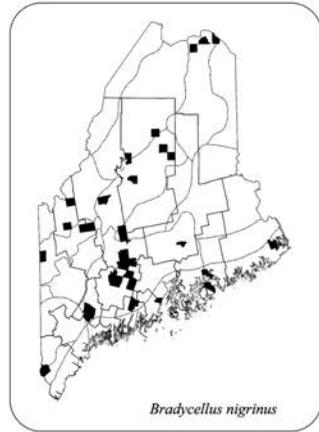
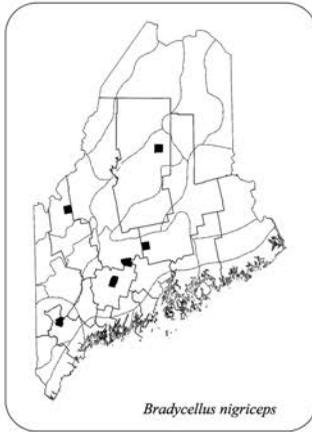
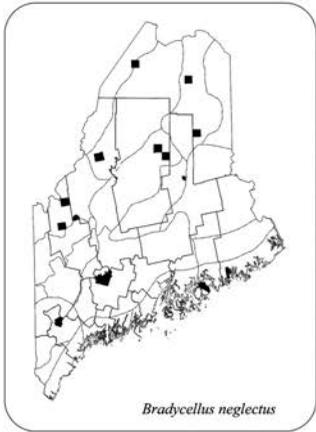


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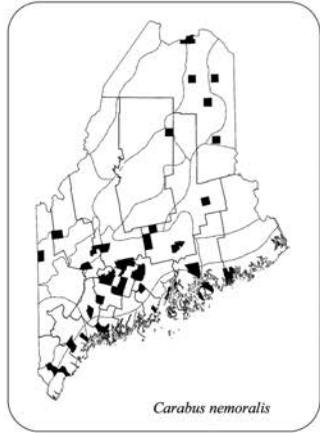
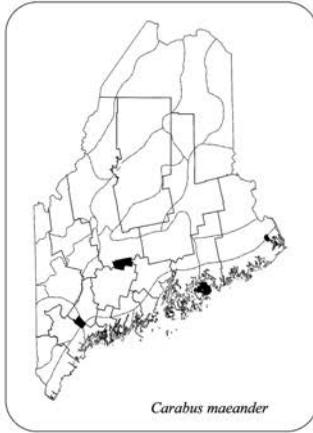
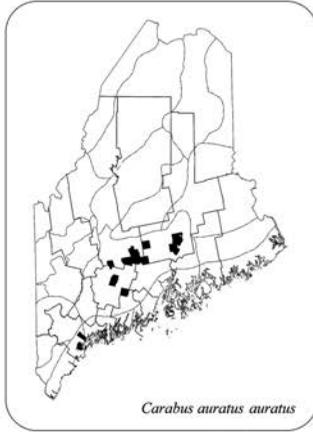
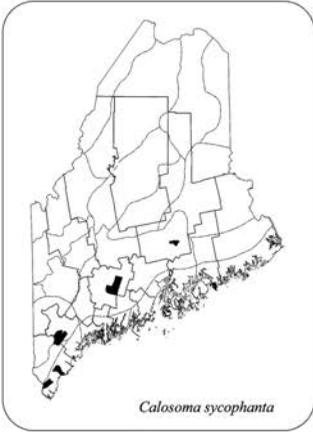
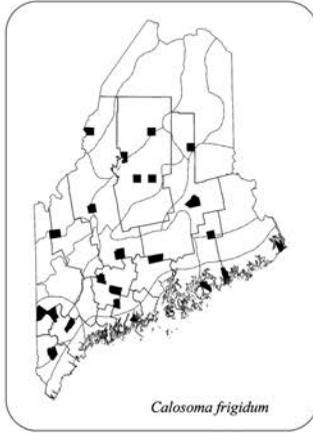
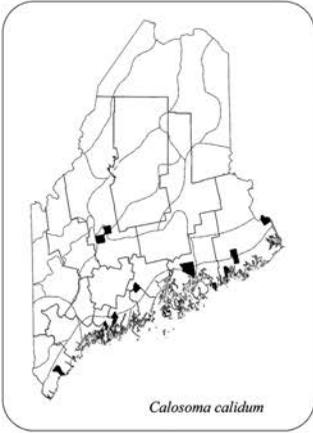


Plate 22

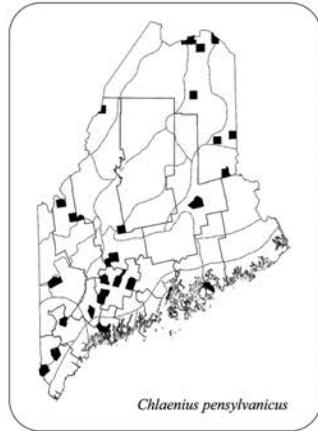
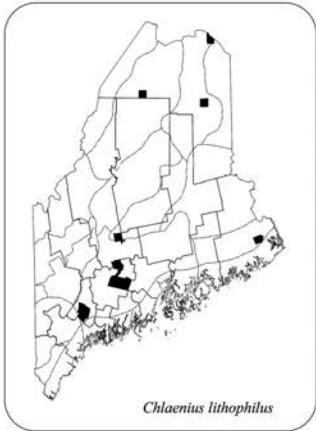
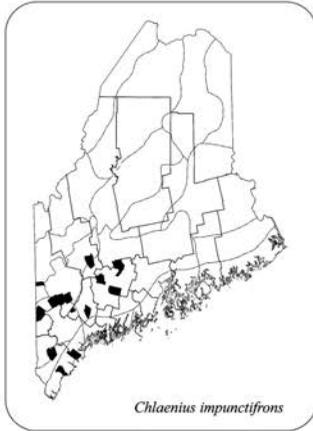
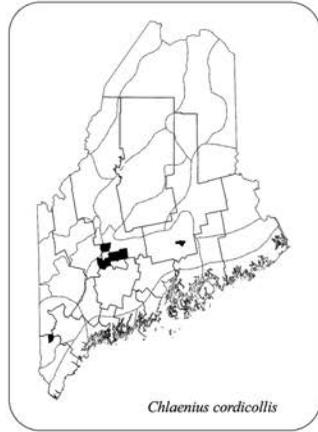
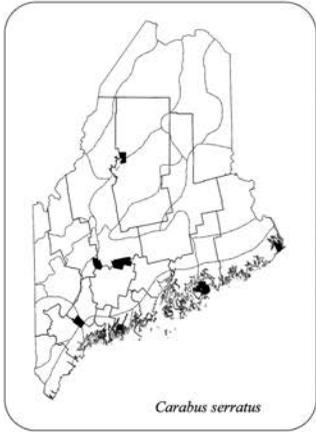


Plate 23

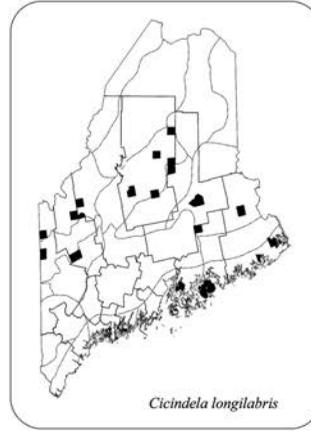
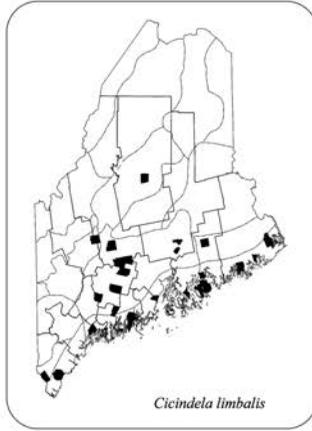
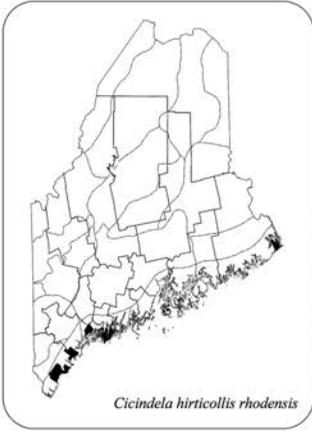
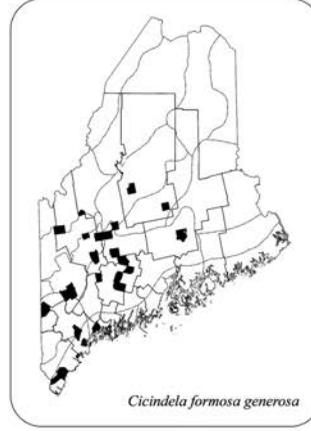
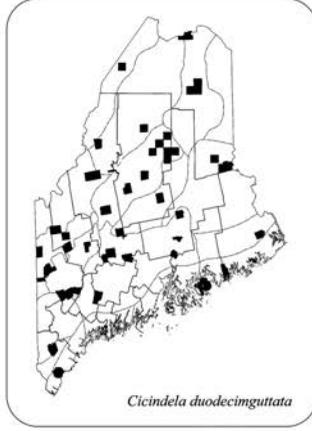
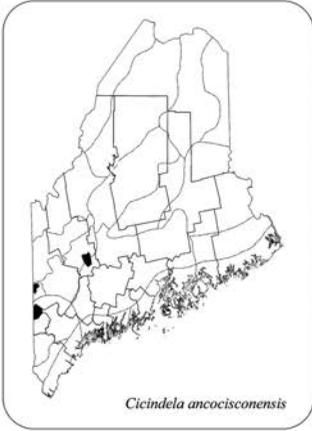
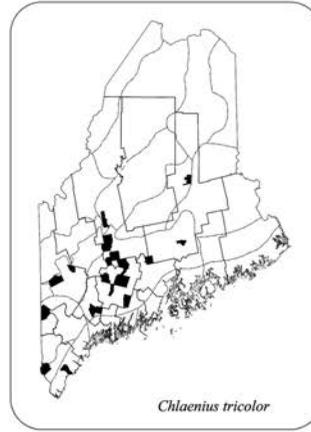
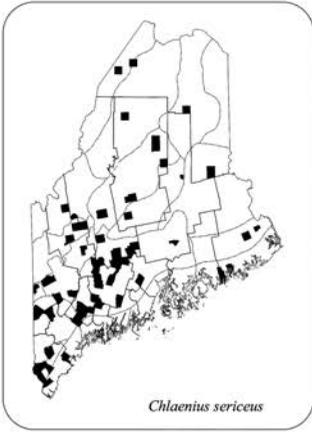


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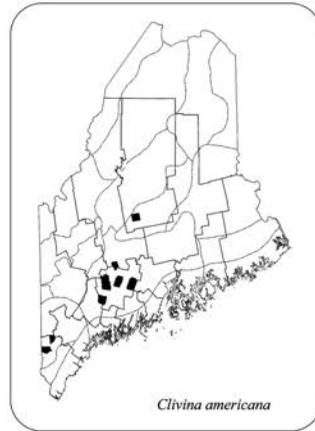
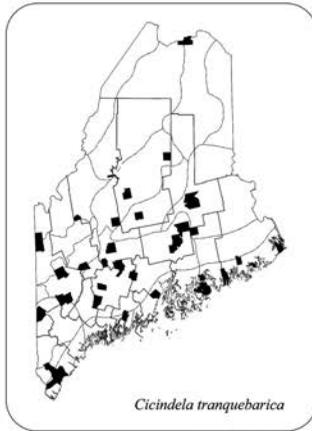
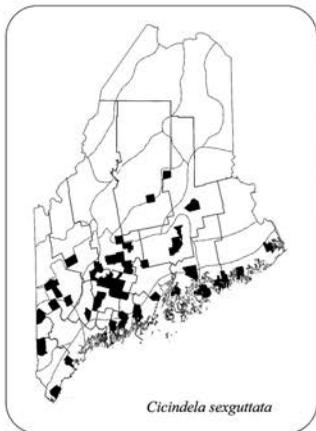
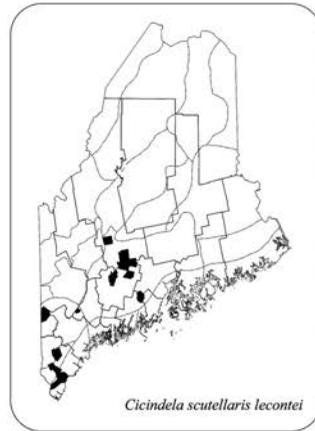
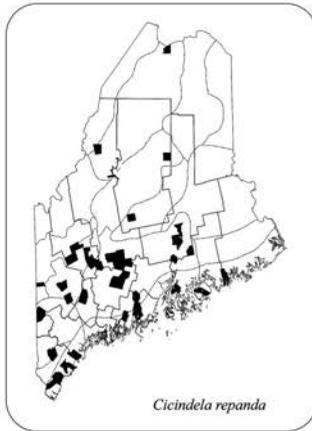
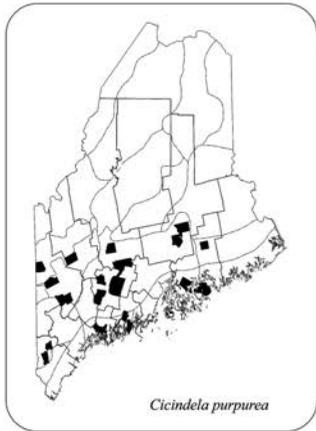
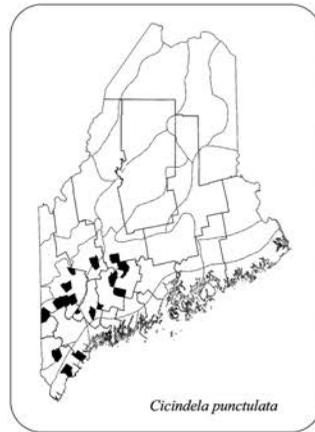


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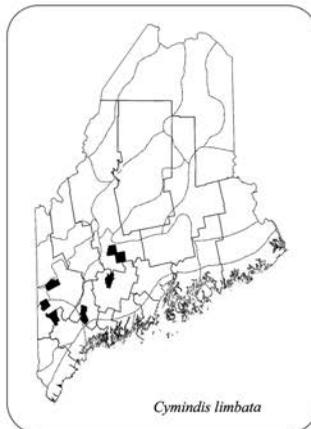
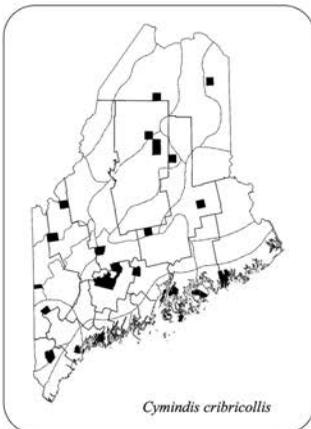
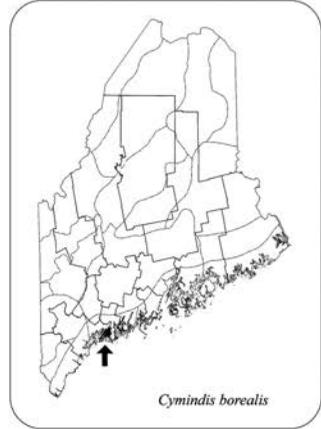
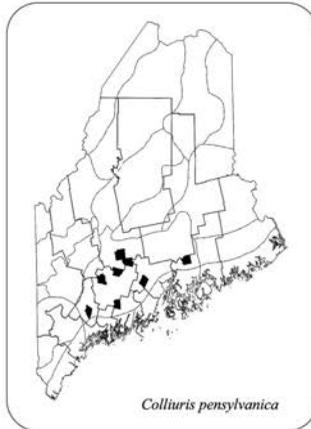
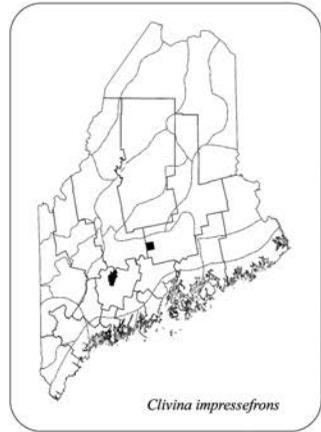
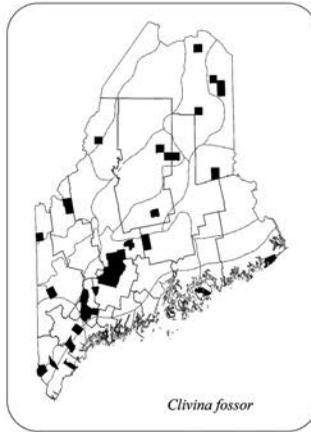


Plate 26

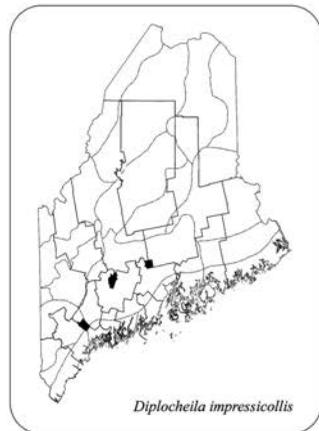
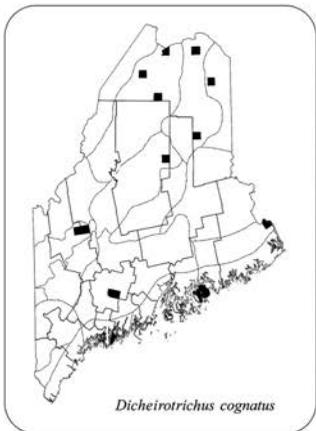
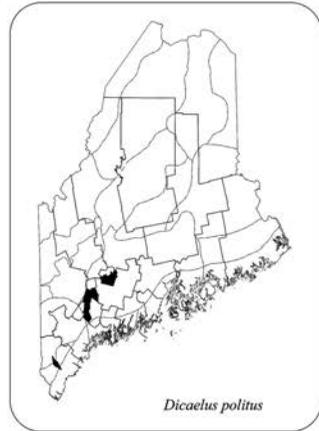


Plate 27

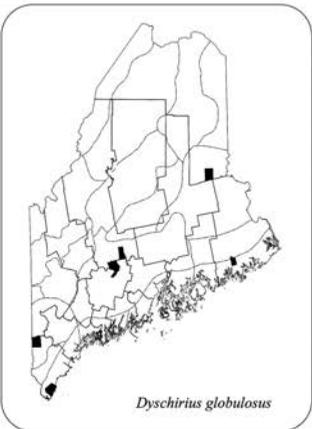
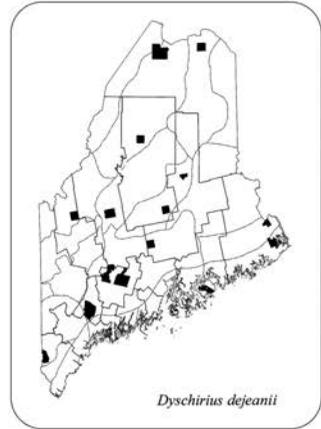
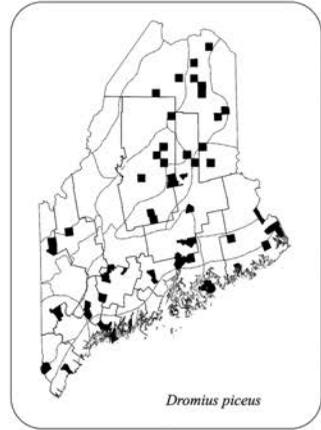
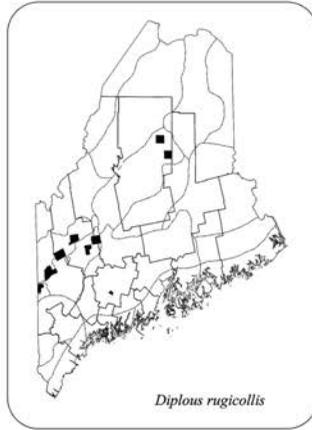
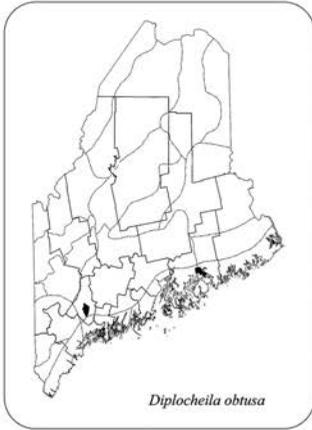


Plate 28

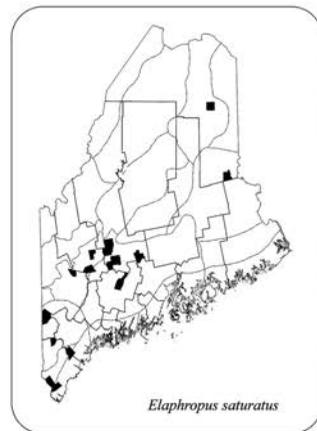
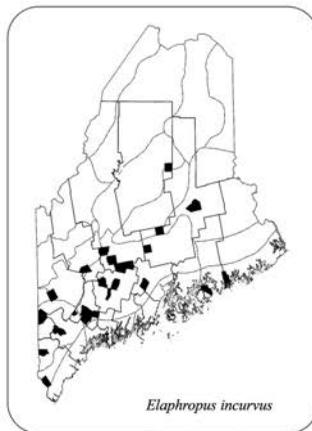
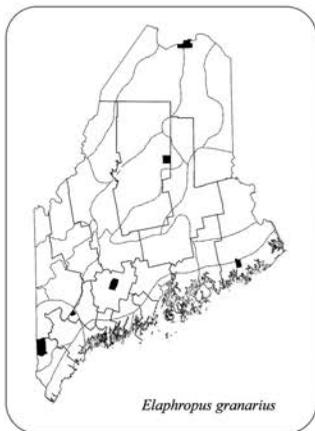
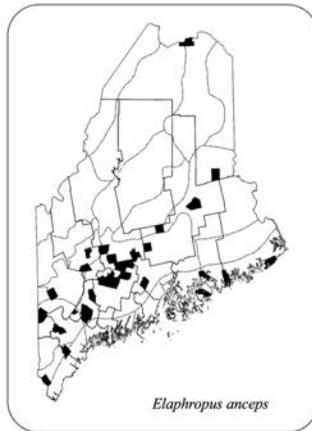
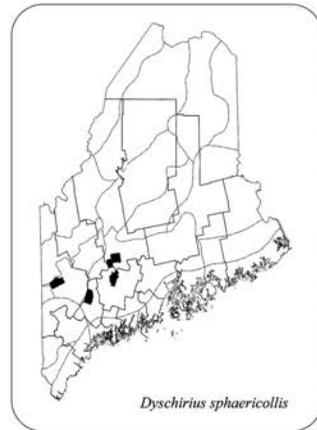
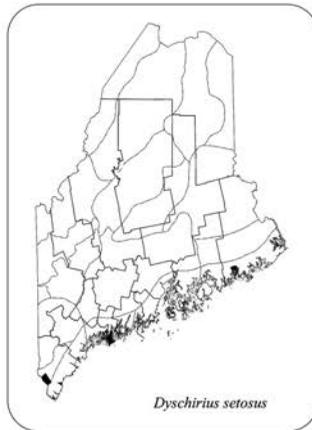


Plate 29

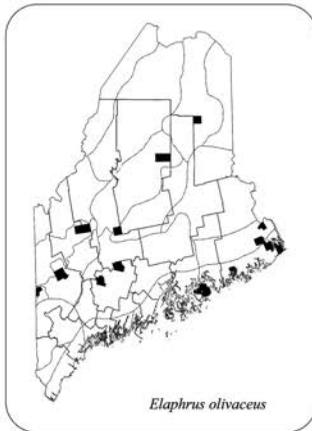
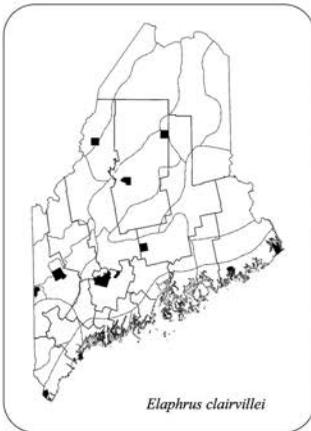
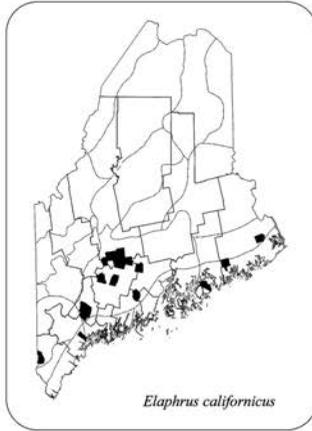
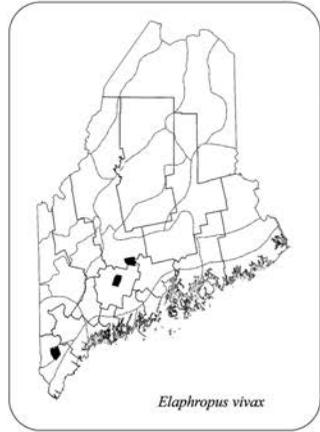
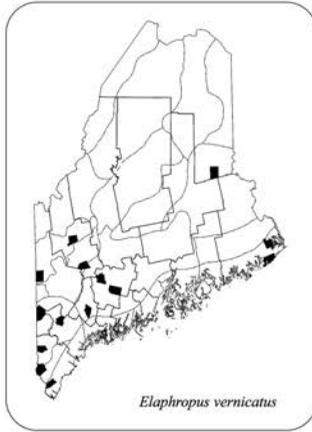


Plate 30

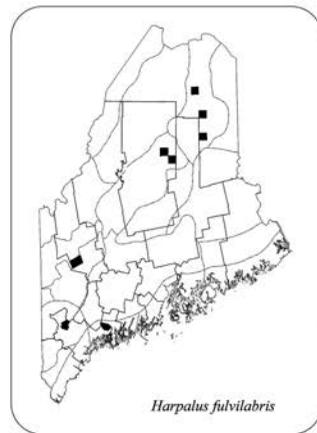
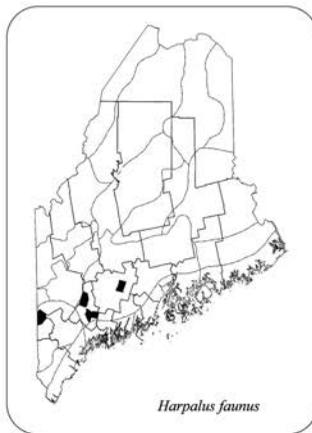
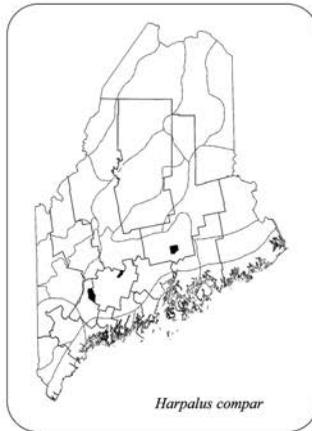
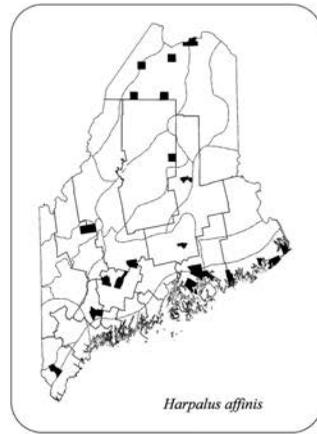
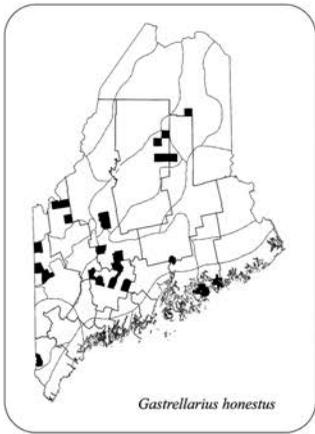


Plate 31

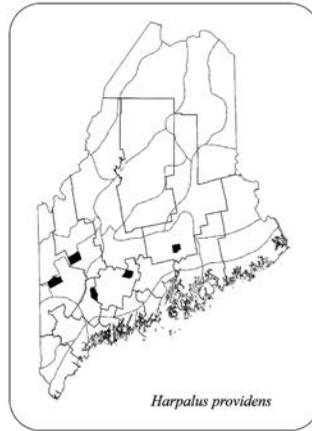
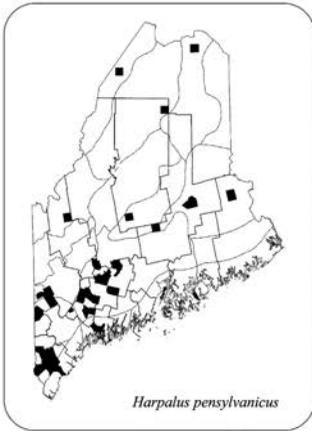
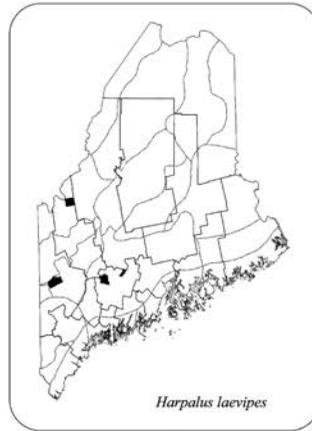
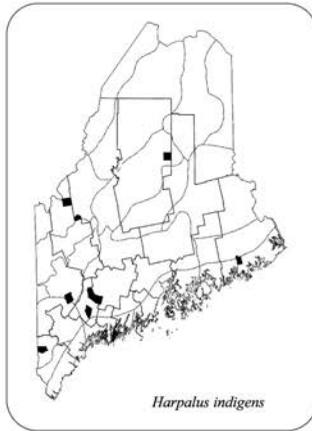
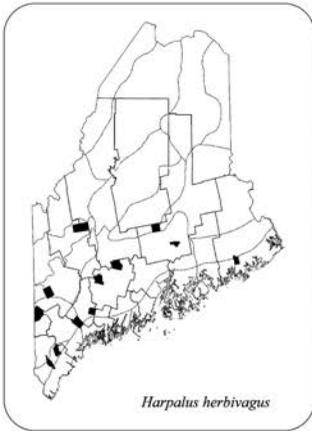


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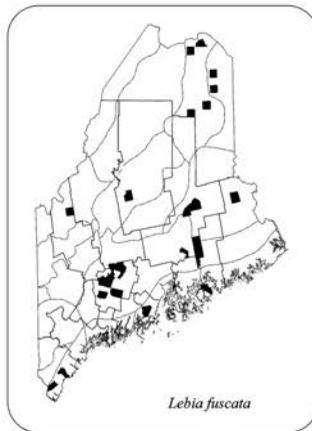
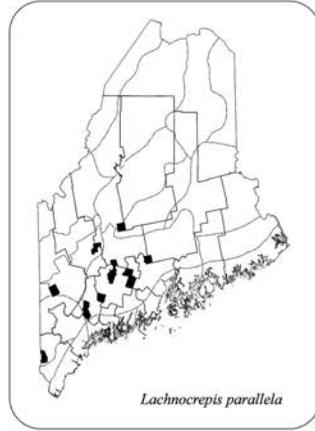
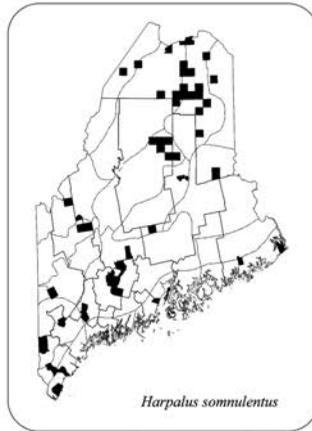
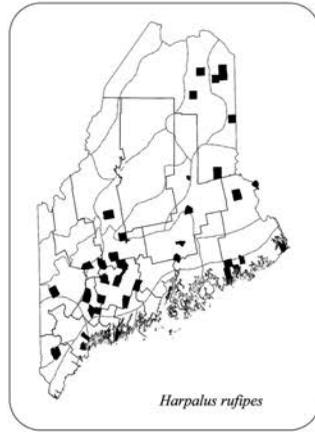
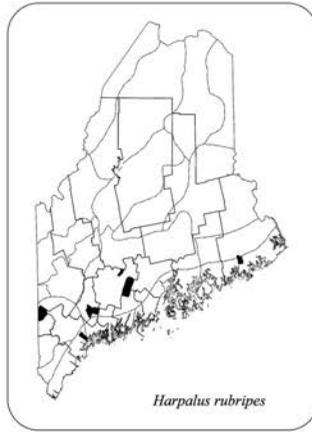


Plate 33

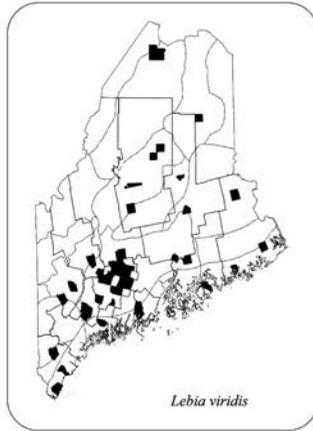
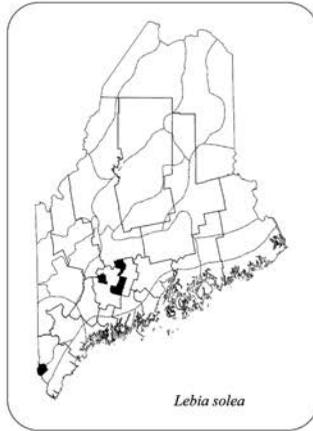
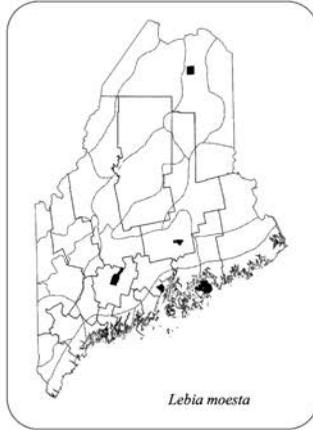


Plate 34

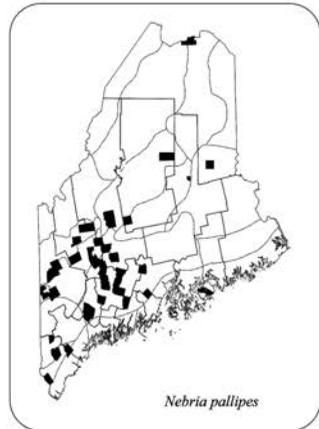
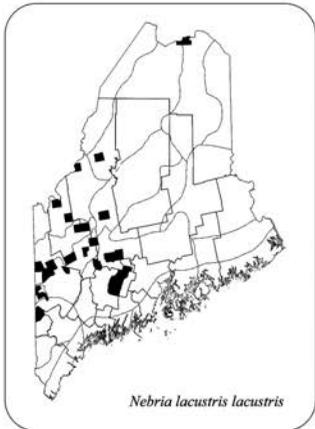
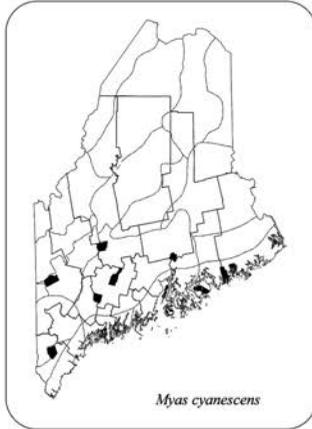
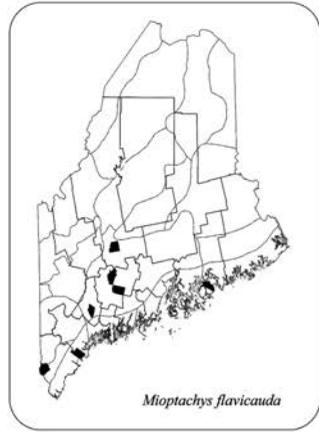
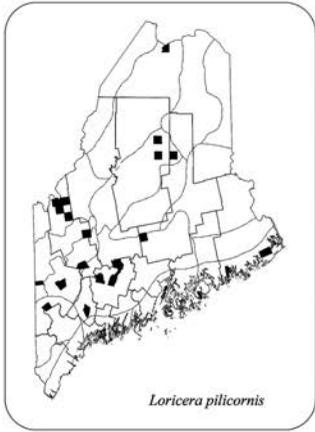


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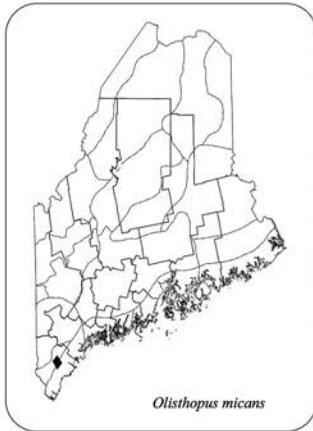
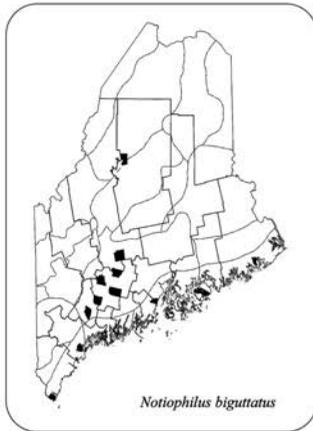
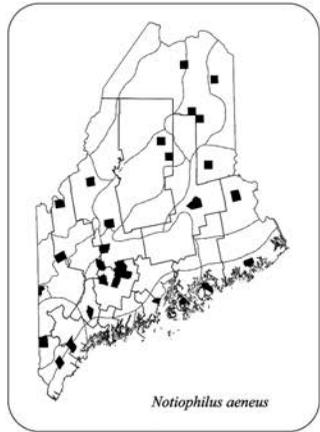
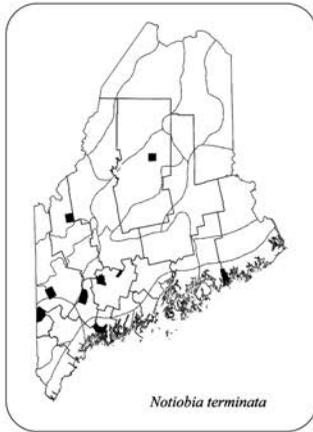


Plate 36

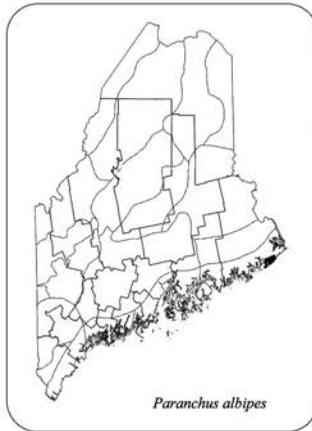
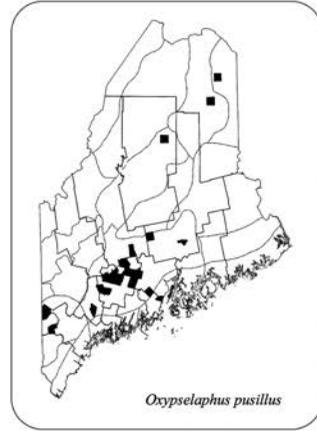
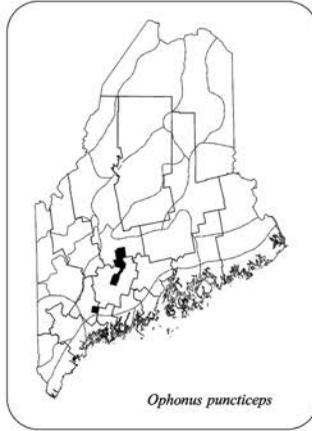
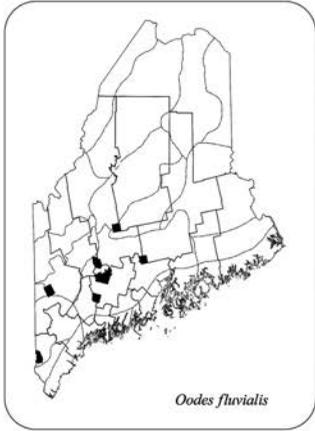
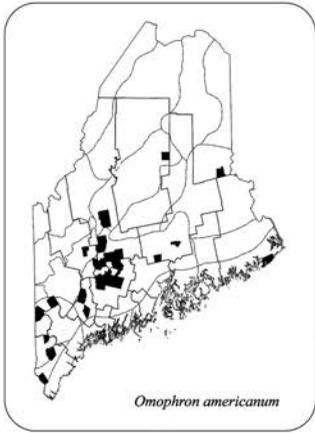


Plate 37

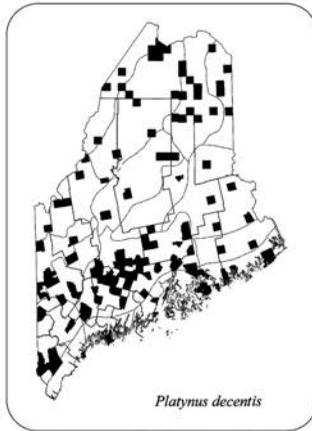
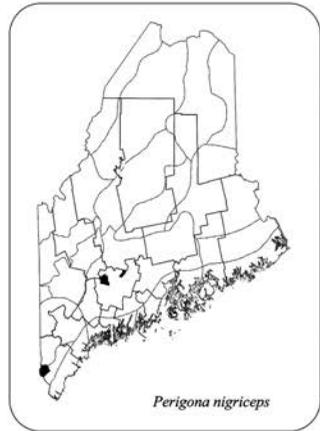
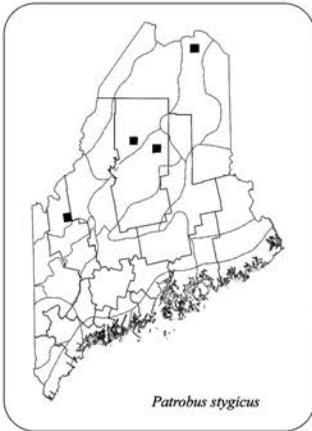
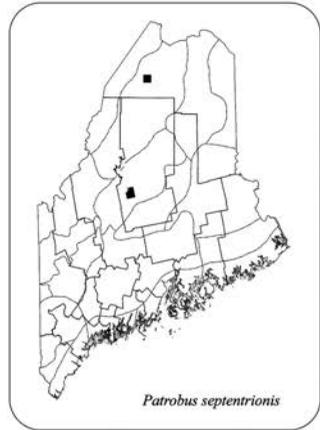
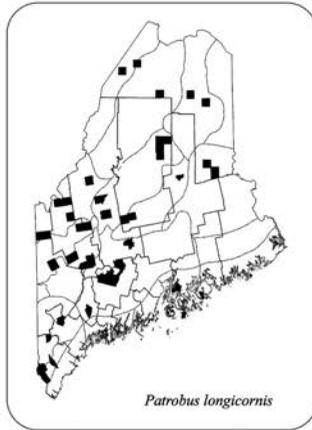


Plate 38

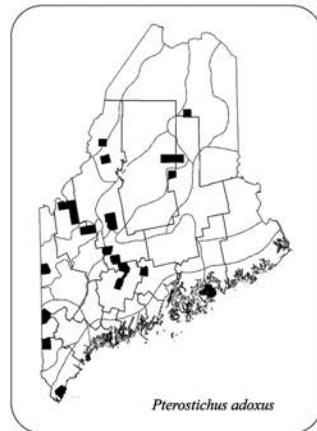
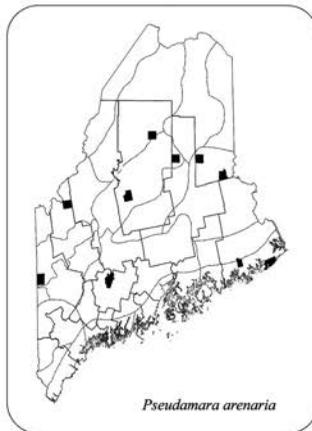
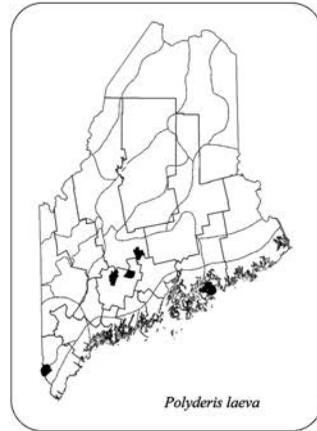
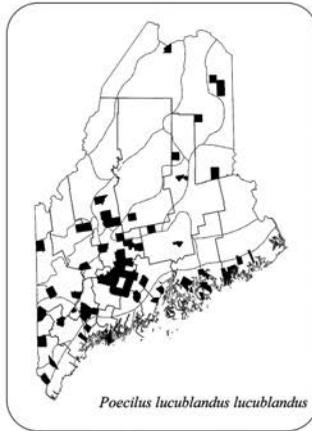
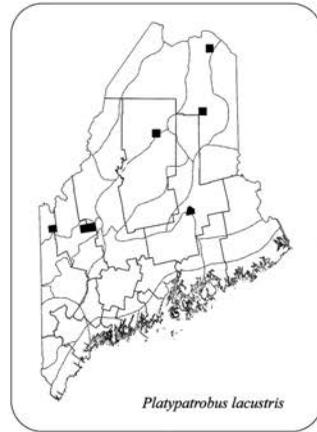
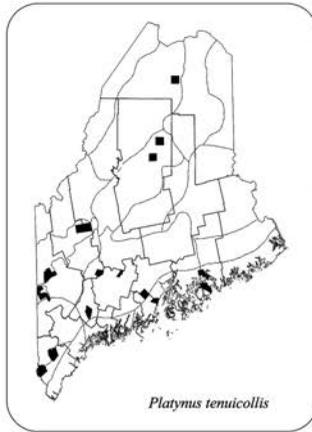
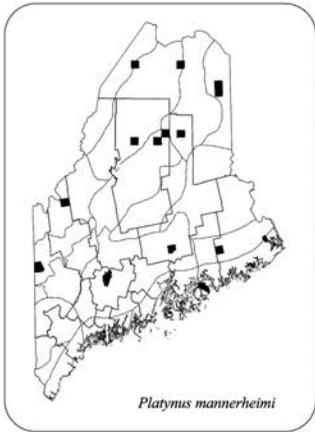


Plate 39

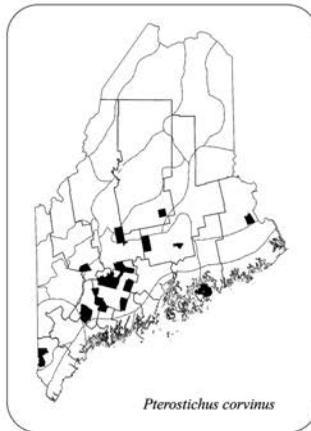
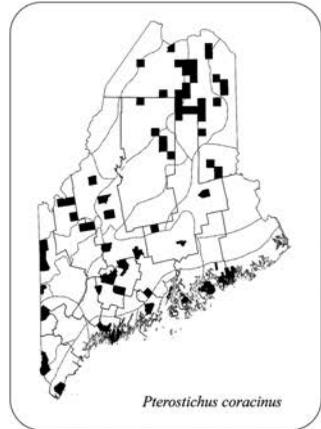
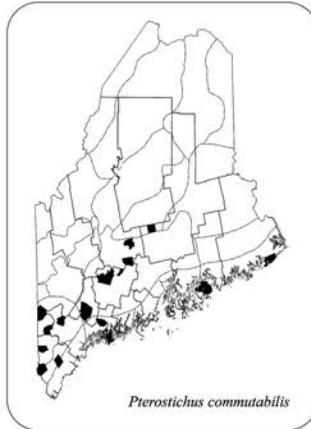
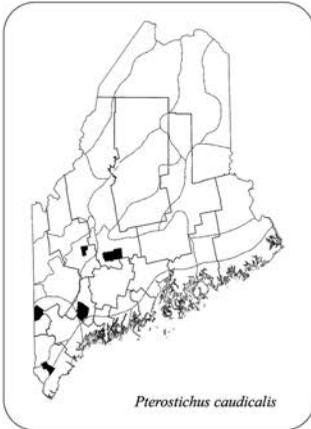
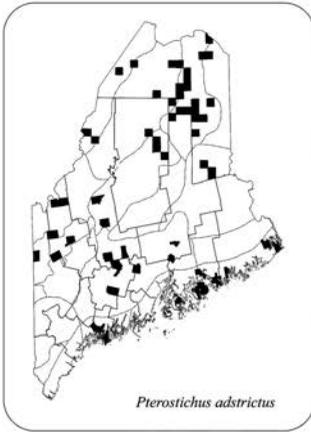


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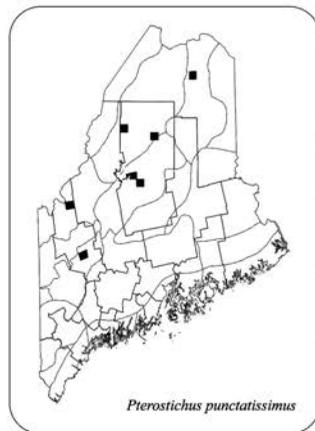
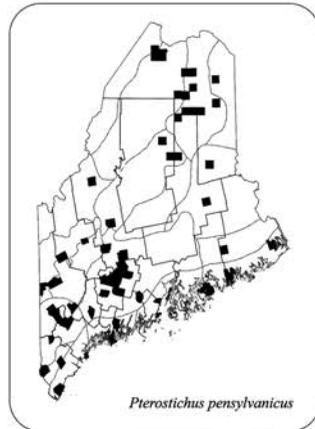
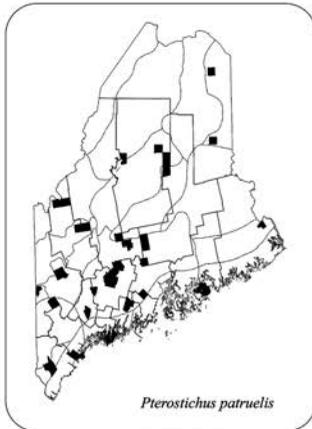
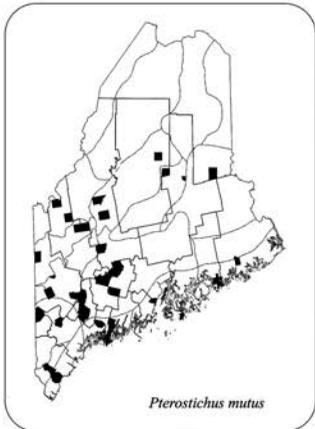
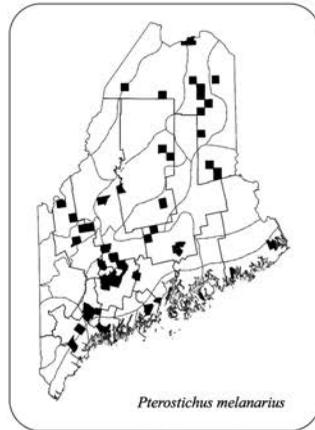
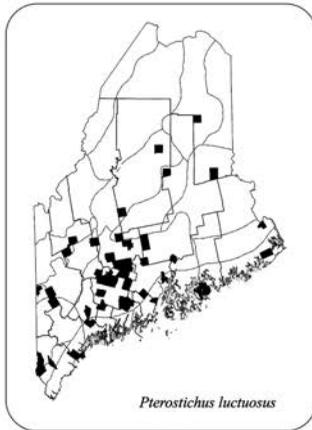
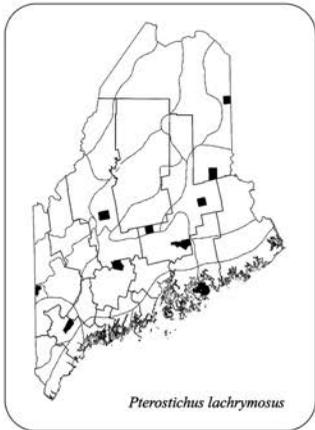


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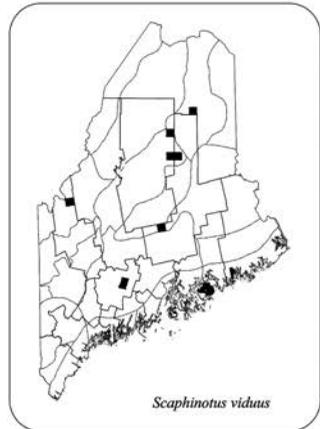
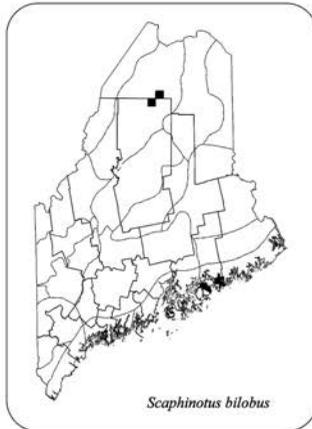
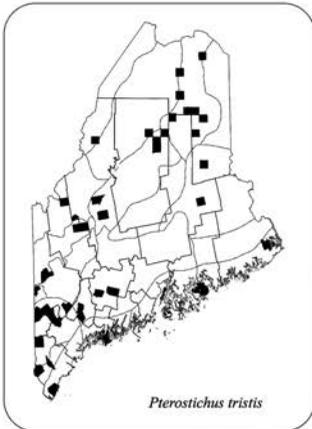
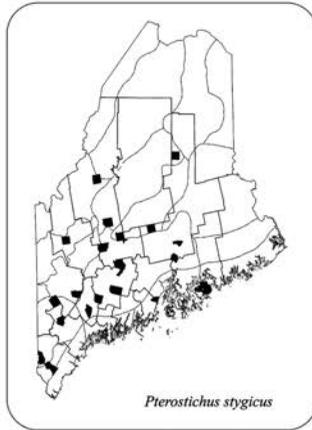
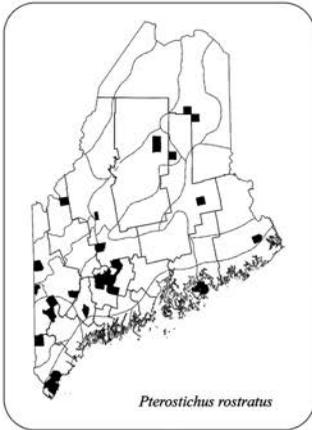


Plate 42

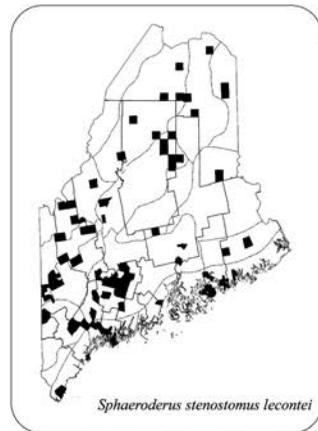
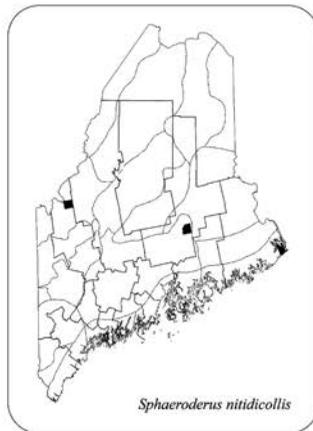
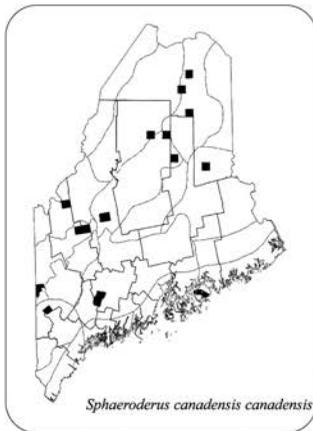
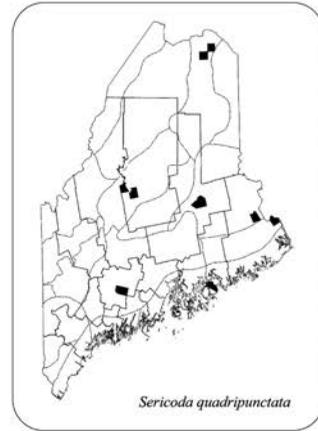
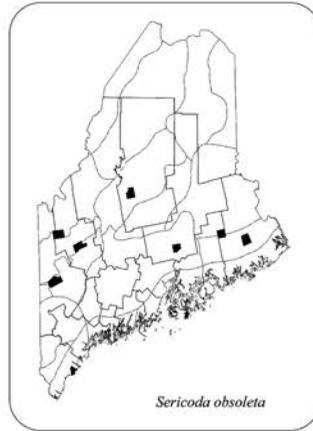
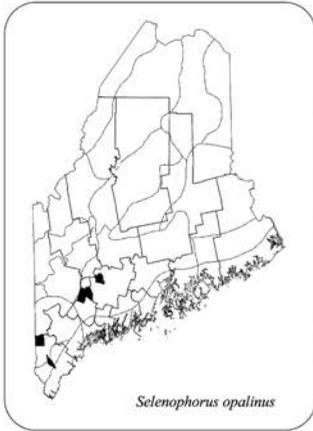
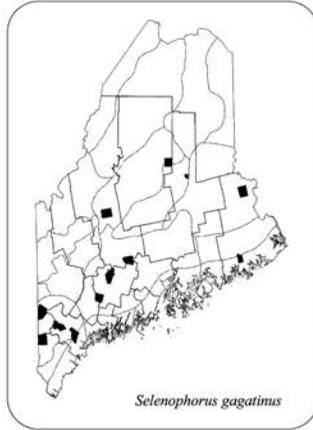
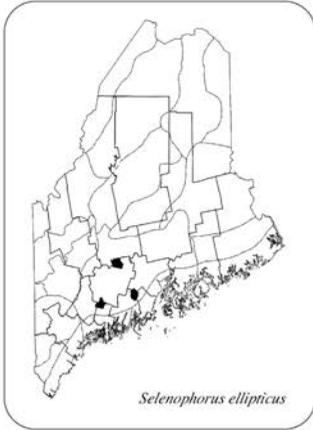


Plate 43

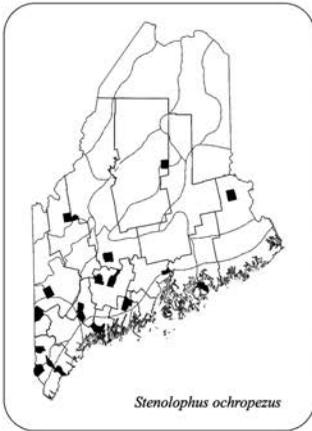
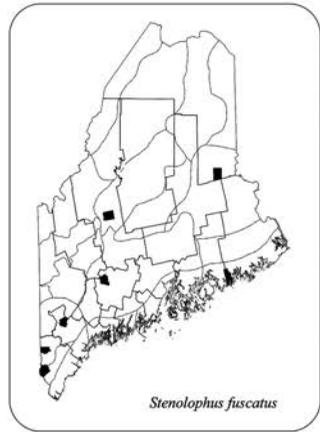
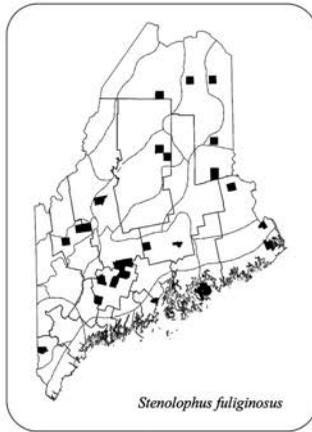
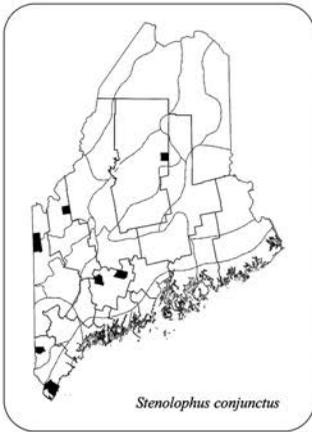


Plate 44

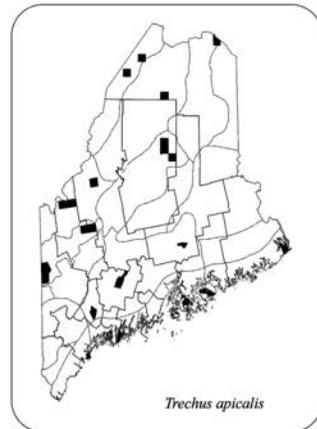
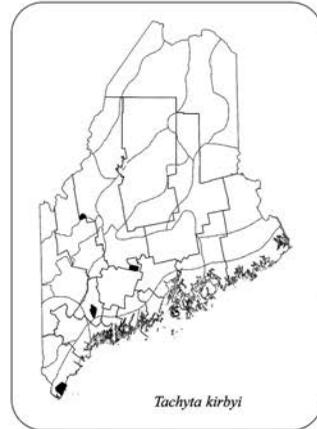
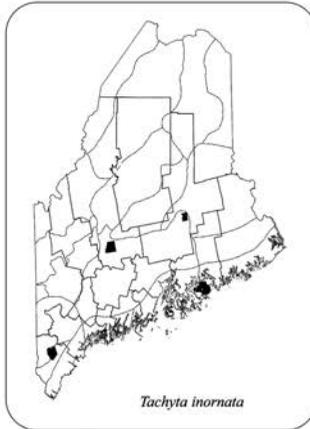
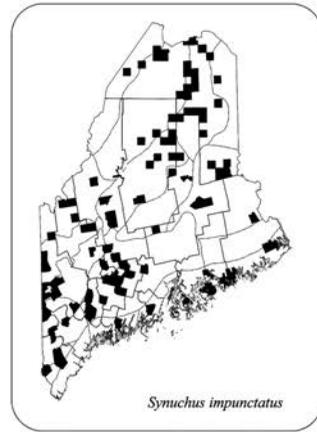
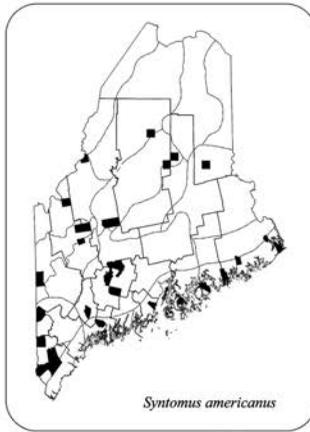


Plate 45

