# Insects of the Idaho National Laboratory: A Compilation and Review

**Nancy Hampton**

**Abstract**—Large tracts of important sagebrush (*Artemisia* L.) habitat in southeastern Idaho, including thousands of acres at the Idaho National Laboratory (INL), continue to be lost and degraded through wildland fire and other disturbances. The roles of most insects in sagebrush ecosystems are not well understood, and the effects of habitat loss and alteration on their populations and communities have not been well studied. Although a comprehensive survey of insects at the INL has not been performed, smaller scale studies have been concentrated in sagebrush and associated communities at the site. Here, I compile a taxonomic inventory of insects identified in these studies. The baseline inventory of more than 1,240 species, representing 747 genera in 212 families, can be used to build models of insect diversity in natural and restored sagebrush habitats.

## Introduction

The Idaho National Laboratory (INL), formerly the Idaho National Engineering and Environmental Laboratory, is located in a cool desert ecosystem characterized by shrub-steppe vegetation communities typical of the northern Great Basin and Columbia Plateau region. Established in 1949 to carry out nuclear energy research and related activities, public access to the 570-thousand-acre INL facility has been restricted for over 50 years. As a consequence, large remnants of relatively undisturbed sagebrush-steppe are still preserved in the interior portion of the site (Anderson 1999). In recognition of the ecological importance of INL lands, the facility was designated as a National Environmental Research Park in 1975 (DOE 1985).

As these important habitats continue to be lost and degraded, interest in the status and condition of remaining sagebrush communities has grown (Entwistle and others 2000; Knick 1999; Knick and Rotenberry 1997). Much is unknown about these ecosystems, and there is an immediate need to establish baselines, fill information voids, and focus research on critical issues, including restoration alternatives.

Nancy Hampton is an Ecologist, Idaho National Laboratory/Idaho State University, P.O. Box 1625, Idaho Falls, ID 83415-2213; e-mail: hampnanc@isu.edu

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Major portions of the INL have been burned by wildfires over the past several years, and restoration and recovery of sagebrush habitat are current topics of investigation (Anderson and Patrick 2000; Blew 2000). Most restoration projects, including those at the INL, are focused on the reestablishment of vegetation communities (Anderson and Shumar 1989; Williams 1997). Insects also have important roles in restored communities (Williams 1997) and show promise as indicators of restoration success in shrub-steppe (Karr and Kimberling 2003; Kimberling and others 2001) and other habitats (Jansen 1997; Williams 1997).

The purpose of this paper is to present a taxonomic list of insects identified by researchers studying cold desert communities at the INL. Insects act as herbivores, decomposers, pollinators, and predators, and they are major prey for reptiles, mammals, and birds inhabiting sagebrush communities, including sage-grouse chicks [*Centrocercus urophasianus* (Bonaparte)]. However, the function of most insects in sagebrush ecosystems is not well understood (West 1983). As natural sagebrush communities disappear, remaining habitats such as those at the INL represent important resources for establishing baseline attributes against which restoration success or indicator measures can be evaluated. A taxonomic inventory is useful for developing reference models of natural insect diversity and community composition in sagebrush habitats at the INL.

## Methods

I constructed a baseline taxonomic list of insect species documented in six major investigations at the INL (Allred 1968a; Allred and Cole 1971; Bohart and Knowlton 1977; Karr and Kimberling 2003; Stafford 1983, 1987; Stafford and Johnson 1986; Stafford and others 1986). The initial list was expanded to include species from 16 smaller studies in which insects were identified or collected (Allred 1970; Blom and others 1991; Bromenshenk 1987; Cieminski and Flake 1995; Clark and Blom 1988, 1991, 1992, 1999; Johnson and Stafford 1986; Merickel and Clark 1994; Stafford and Johnson 1986; Vieth 1983; Wenninger 2001; Winter 1984; Youtie 1986; Youtie and others 1987). A resident collection of INL voucher specimens for 466 species, primarily collected and identified by M. P. Stafford, W. H. Clark, and P.E. Blom, was also incorporated into the list. All insects identified to family were included. Although over 100 species of other arthropods, including ticks, mites, spiders, solpugids, and scorpions, have been collected and identified at the INL (Allred 1968b, 1969,

1970, 1973; Allred and Muma 1971; Karr and Kimberling 2003; Wenninger 2001), only insect species were compiled for this list. Ordinal names and placement of families and genera are according to Borror and others (1992).

To minimize the potential for double counting, I included only the maximum number of unidentified species within the same family or genus cited in any single reference. The number of unidentified species was then reduced for each unique species within the same family or genus cited in additional references. Thus, hundreds of unidentified specimens were excluded from this inventory and remain to be examined further.

Taxonomic authority was compiled from original documentation, voucher specimens, and other local and regional species lists (Haws and others 1988; Horning and Barr 1970). The INL list was not reviewed for synonymy or misidentifications. Discrepancies in spelling between INL studies and other authorities were reconciled to Horning and Barr (1970) where possible. Otherwise, spellings of Haws and others (1988) or Arnett (2000) were adopted.

## Results and Discussion

A list of over 1,240 insect species from 17 orders, representing 747 genera in 212 families, was compiled from 22 studies conducted at the INL (table 1). Insect sampling has been widely distributed across the INL (fig.1), but most studies were of short duration and focused on associations

**Table 1—**List of documented insect species at the Idaho National Engineering and Environmental Laboratory.

| **ORDER**[a] |
|---|
| **Family**[a] |
| Scientific name[b] |
| **COLLEMBOLA** |
| **Onychiuridae** |
| spp. undetermined |
| **Entomobryidae** |
| spp. undetermined |
| **Isotomidae** |
| unident. sp. #1 |
| **Sminthuridae** |
| unident. sp. #1 |
| **EPHEMEROPTERA** |
| **Baetidae** |
| spp. undetermined |
| **Caenidae** |
| spp. undetermined |
| **ISOPTERA** |
| **Kalotermitidae** |
| unident. sp. #1 |
| **ODONATA** |
| **Aeshnidae** |
| unident. sp. #1 |
| **Libellulidae** |
| unident. sp. #1 |
| **Coenagrionidae** |
| spp. undetermined |
| **PSOCOPTERA** |
| **Liposcellidae** |
| unident. sp. #1 |
| **PHTHIRAPTERA** |
| **Enderleinellidae** |
| *Enderleinellus* sp. |
| **Hoplopleuridae** |
| *Hoplopleura acanthopus* |
| *Hoplopleura arboricola* |
| *Hoplopleura erratica* |
| *Hoplopleura hesperomydis* (Osborn) |
| *Hoplopleura minimus* |
| **Polyplacidae** |
| *Fahrenholzia pinnata* |
| *Fahrenholzia* sp. #2 |
| *Haemodipus setoni* |
| *Neohaematopinus inornatus* Kellogg |
| *Neohaematopinus laeviusculus* |

| **ORDER** |
|---|
| **Family** |
| Scientific name |
| *Neohaematopinus marmota* |
| *Neohaematopinus pacificus* |
| *Neohaematopinus* sp. #5 |
| *Polyplax auricularis* Kellogg and Ferris |
| *Polyplax spinulosa* Burmeister |
| *Polyplax* sp. #3 |
| **Trichodectidae** |
| *Geomydoecus* sp. |
| *Neotrichodectes interruptofasciatus* |
| **Mallophaga** |
| spp. undetermined |
| **ORTHOPTERA** |
| **Acrididae** |
| *Arphia pseudonictana* Thomas |
| *Aulocara elliotti* Thomas |
| *Cratypedes lateritius* |
| *Hesperotettix viridis* Thomas |
| *Melanoplus sanguinipes* (Fabricius) |
| *Trimerotropis gracilis* |
| unident. spp. #1, #2 |
| **Tettigoniidae** |
| unident. sp. #1 |
| **Gryllacrididae** |
| *Ceuthophilus maculatus* |
| **Gryllidae** |
| *Oecanthus* sp. |
| unident. spp. #1, #2 |
| **HEMIPTERA** |
| **Enicocephalidae** |
| unident. sp. #1 |
| **Corixidae** |
| *Cenocorixa wileyae* |
| *Sigara alternata* |
| **Notonectidae** |
| spp. undetermined |
| **Tingidae** |
| *Aclypta cooleyi* |
| unident. sp. #2 |
| **Miridae** |
| *Atomoscelis modestus* VanDuzee |
| *Chlamydatus artemisiae* |
| *Chlamydatus associatus* (Uhler) |

(con.)

**Table 1—**(Cont.)

| ORDER<br>**Family**<br>Scientific name |
|---|
| *Chlamydatus obliquus* (Uhler) |
| *Chlamydatus* sp. #4 |
| *Coquilletia insignis* Uhler |
| *Coquilletia* sp. #2 |
| *Deraeocoris bakeri* Knight |
| *Deraeocoris brevis* Uhler |
| *Deraecoris schwartzi* (Uhler) |
| *Hadronema simplex* Knight |
| *Hesperocapsus davisi* |
| *Illnacorella argentata* Knight |
| *Irbisia pacificus* (Uhler) |
| *Labopidea sericata* (Uhler) |
| *Labops utahensis* Slater |
| *Litomeris debilis* (Uhler) |
| *Lopidea* sp. |
| *Lygus desertinus* Knight |
| *Lygus elisus* VanDuzee |
| *Lygus hesperus* Knight |
| *Lygus* sp. #4 |
| *Melanotrichus albocostatus* |
| *Orectoderus arcuatus* |
| *Orthotylus coagulatus* (Uhler) |
| *Parthenicus* sp. |
| *Phyllopidea hirta* |
| *Phyllopidea picta* Uhler |
| *Phytocoris* sp. |
| *Pilophorus* sp. |
| *Plagiognathus* sp. |
| *Polymerus diffusus* Knight |
| *Psallus pilosulus* Uhler |
| *Psallus* sp. |
| *Slaterocoris pilosipes* |
| *Slaterocoris utahensis* |
| *Slaterocoris* sp. #3 |
| *Stenodema laevigatum* (L.) |
| *Stenodema pilosipes* |
| *Stenodema virens* (L.) |
| *Stenodema vicinum* |
| *Thyrillus pacificus* (Uhler) |
| *Trigonotylus ruficornis* (Geoffroy) |
| **Nabidae** |
| *Nabis alternatus* (Parshley) |
| *Reduviolus alternatus* |
| **Anthocoridae** |
| *Orius tristicolor* White |
| **Reduviidae** |
| *Sinea diadema* (F.) |
| *Zelus tetracanthus* |
| unident. sp. #1 |
| **Piesmatidae** |
| *Piesma* sp. |
| **Phymatidae** |
| unident. sp. #1 |
| **Corimelaenidae** |
| *Corimelaena virilis* M. and Mc. |
| **Lygaeidae** |
| *Blissus* sp. |
| *Emblethis vicarius* |
| *Geocoris pallens* Stal |
| *Leptoterna* sp. |
| *Lygaeus kalmii* Stal |
| *Malezonotus* sp. |
| *Megalonotus sabicula* |
| *Nysius ericae* (Schilling) Auctorum |
| *Nysius niger* |
| *Nysius raphanus* Horvath |
| *Ortholomus scolopax* (Say) |
| *Sisamnes claviger* Coreidae |
| *Chelinidae vittiger* |
| **Rhopalidae** |
| *Arhyussus* sp. |
| *Corizus punctiventris* Dallas |
| *Corizus scutatus* (Stal) |
| *Harmostes reflexulus* (Say) |
| *Leptocoris trivittatus* (Say) |
| *Liorhyssus hyalinus* (F.) |
| **Cydnidae** |
| unident. sp. #1 |
| **Scutelleridae** |
| *Vanduzeina balli* |
| unident. sp. #1 |
| **Pentatomidae** |
| *Aelia americana* Dallas |
| *Chlorochroa sayi* Stal |
| *Codophila remota* Horvath |
| *Prionosoma podopioides* |
| *Rhytidilomia uhleri* Stal |
| **HOMOPTERA** |
| **Cicadidae** |
| *Okanagana annulata* Davis |
| *Okanagana bella* Davis[c] |
| *Okanagana luteobasalis* Davis |
| *Platypedia putnami lutea* Davis |
| **Membracidae** |
| *Campylenchia latipes* (Say) |
| *Tortistillus wickhami* VanDuzee |
| **Aetalionidae** |
| *Aetalion* sp. |
| **Cercopidae** |
| *Clastoptera brunnea* Bale |
| *Clastoptera delicata* Uhler |
| *Neophilaenus lineatus* (L.) |
| *Philaronia* sp. |
| **Cicadellidae** |
| *Aceratagallia poudris* (Stal) |
| *Aceratagallia* sp. #2 |
| *Athysanella* spp. #1, #2 |
| *Balclutha* sp. |
| *Ballana hebea* |
| *Ballana* sp. #2 |
| *Calladonus montanus* VanDuzee |
| *Carsonus aridus* |
| *Ceratagallia artemisia* Oman |
| *Chlorotettix unicolor* Fitch |
| *Circulifer tenellus* Baker |
| *Comellus* sp. |
| *Dikraneura carneola* (Stal) |
| *Empoasca alboneura* |
| *Empoasca aspersa* G. & B. |
| *Empoasca nigra* G. & B. |
| *Exitianus exitiosus* |
| *Exitianus* sp. |
| *Hecalus viridis* (Uhler) |

(con.)

**Table 1—**(Cont.)

| ORDER<br>**Family**<br>Scientific name |
|---|
| *Idiocerus* sp. |
| *Idiodonus geminatus* |
| *Norvellina vermiculata* |
| *Parabolocratus viridis* Uhler |
| *Texananus* sp. |
| *Xerophloea viridis* (Uhler) |
| **Delphacidae** |
| *Eurysa obesa* Beamer |
| unident. spp. #1 to #3 |
| **Fulgoridae** |
| *Delphacodes pellucida* (F.) |
| *Delphacodes campestris* VanDuzee |
| unident. sp. #1 |
| **Psillidae** |
| *Aphalara artemesiae* Forster |
| *Aphalara calthae* (L.) |
| *Aphalara loca* Calderwood |
| *Aphalara minutissima* Crawford |
| *Calophya triozoma* Schwarz |
| **Aphididae** |
| *Aphis gregalis* Knowlton |
| *Aphis ornata* (Gillette & Palmer) |
| *Brachycaudus helichrysi* (Kaltenbach) |
| *Durocapillata utahensis* Knowlton |
| *Forda marginata* (Koch) |
| *Microsiphoniella acophorum* (Knowlton & Smith) |
| *Myzus persicae* (Sulzer) |
| *Obtusicauda artemisicola* |
| *Pleotrichophorus pycnorhysus* (Knowlton & Smith) |
| *Pleotrichophorus utensus* (Pack & Knowlton) |
| *Uroleucon escalanti* Knowlton |
| *Zyxaphis canae* (Williams) |
| *Zyxaphis filifoliae* Gillette & Palmer |
| **Phylloxeridae** |
| unident. sp. #1 |
| **Margarodidae** |
| unident. sp. #1 |
| **Coccidae** |
| unident sp. #1 |
| **Pseudococcidae** |
| *Phenacoccus* sp. |
| **THYSANOPTERA** |
| **Aeolothripidae** |
| *Aeolothrips auricestus* Treherne |
| *Aeolothrips fasciatus* |
| **Thripidae** |
| *Aptinothrips rufus* (Gmelin) |
| *Frankliniella occidentalis* (Pergande) |
| *Sericothrips* sp. |
| *Thrips tabaci* |
| **Oelolothripidae** |
| *Oelolothrips* sp. |
| **Phlaeothripidae** |
| *Leptothrips mali* (Fitch) |
| unident. sp. #1 |
| **NEUROPTERA** |
| **Coniopterygidae** |
| unident. sp. #1 |
| **Hemerobiidae** |
| *Hemerobius* sp. |
| *Kimminsia coloradensis* (Banks) |
| *Micromus variolus* (Hagen) |
| **Chrysopidae** |
| *Chrysopa coloradensis* Banks |
| *Chrysopa nigricornis* |
| *Eremochrysis punctinervis* MacLachlan |
| **Myrmeleontidae** |
| *Myrmeleon* sp. |
| **COLEOPTERA** |
| **Cicindelidae** |
| *Cicindela decemnotata* Say |
| *Cicindela purpurea* |
| **Carabidae** |
| *Agonum balesi* Gray |
| *Agonum placidum* (Say) |
| *Amara apricaria* Paykull |
| *Amara farcata* LeConte |
| *Amara impuncticollis* Say |
| *Amara laticollis* LeConte |
| *Amara littoralis* |
| *Amara musculus* Say |
| *Amara quenseli* Schönherr |
| *Apristus* sp. |
| *Axinopalpus biplagiatus* (Dejean) |
| *Bembidion immaculosum* Hatch |
| *Bembidion nebraskense* LeConte |
| *Bembidion obscurellum* Motschulsky |
| *Bembidion rupicola* Kirby |
| *Bembidion timidum* LeConte |
| *Bradycellus congener* |
| *Calleida viridis* |
| *Calosoma luxatum* Say |
| *Clivina fossor* |
| *Cymindis planipennis* LeConte |
| *Dicheirus piceus* Menetries |
| *Harpalus amputatus* Say |
| *Harpalus basilaris* Kirby |
| *Harpalus fraternus* LeConte |
| *Harpalus* sp. |
| *Lebia vittata* (Fabricius) |
| *Microlestes nigrinus* (Mannerheim) |
| *Philophuga viridis* Dejean |
| *Piosoma setosa* LeConte |
| *Pseudomorpha behrensi* Horn |
| *Pterostichus* sp. |
| **Haliplidae** |
| spp. undetermined |
| **Dytiscidae** |
| *Laccophilus decipiens* LeConte |
| **Gyrinidae** |
| spp. undetermined |
| **Ptiliidae** |
| spp. undetermined |
| **Leiodidae** |
| *Hydnobius* sp. |
| *Letodes grassa* |
| *Ptomophagus californicus* (LeConte) |
| **Silphidae** |
| *Nicrophorus hecate* Bland |
| *Nicrophorus guttulus* Motschulsky |
| **Staphylinidae** |
| *Acratona* sp |
| *Aleochara* sp. |

(con.)

**Table 1—**(Cont.)

**ORDER**
**Family**
Scientific name

*Aleocharinae* spp. #1, #2
*Anotylus* sp.
*Astenus longiusculus*
*Bledius strenuus* Casey
*Bryoporus testaceus*
*Oxypoda* sp.
*Philonthus concinnus* (Gravenhorst)
*Philonthus cruentatus* (Gmelin)
*Platystethus americanus* (Erichson)
*Quedius* sp.
*Tachinus angustatus* Horn
*Tachyporus canadensis*
**Pselaphidae**
*Pilopius* sp.
**Eucnemidae**
*Analestes* sp.
**Hydrophilidae**
*Berosus fraternus* LeConte
*Berosus styliferus* Horn
*Cercyon quisquilius* (L.)
*Helophorus* sp.
*Sphaeridium scarabaeoides* (L.)
**Histeridae**
*Psiloscelis corrosa* Casey
*Saprinus lanei*
*Saprinus lugens* Erichson
*Saprinus oregonensis* LeConte
*Xerosaprinus acilinea* (Marseul)
*Xerosaprinus lubricus* (LeConte)
**Eucinetidae**
unident. sp. #1
**Scarabaeidae**
*Aphodius denticulatus* Haldeman
*Aphodius distinctus* Muller
*Aphodius fossor* (L.)
*Aphodius granarius* (L.)
*Aphodius hirsutus* Brown
*Aphodius militaris* (?) LeConte
*Aphodius vittatus* Say
*Bolbocerus obesus*
*Boreocanthon simplex* (LeConte)
*Cremastocheilus crinitus bifoviatus* Van Dyke
*Dichelonyx truncata* LeConte
*Dichelonyx* sp. #2
*Diplotaxis brevicollis*
*Diplotaxis obscura* LeConte
*Diplotaxis subangulata* LeConte
*Diplotaxis tenebrosa* Fall
*Glaresis canadensis* Brown
*Glaresis clypeata*
*Ochodaeus simplex* LeConte
*Paracotalpa granicollis* (Haldeman)
*Phyllophaga sociata*
*Serica anthracina* LeConte
*Serica barri* Dawson
*Trox* sp.
**Buprestidae**
*Acmaeodera immaculata* Horn
*Agrilus politus* Say
*Agrilus pubifrons* Fisher
*Agrilus walsinghami* Crotch
*Anthaxia retifer* LeConte

**ORDER**
**Family**
Scientific name

*Chrysobothris deleta* LeConte
*Chrysobothris horningi* Barr
*Chrysobothris idahoensis* Barr
*Chrysobothris texana* LeConte
**Heteroceridae**
*Lanternarius brunneus* (Melsheimer)
*Nannularia brunneata* (Knull)
**Elmidae**
spp. undetermined
**Elateridae**
*Aeolus dorsalis*
*Aeolus mellilus*
*Agriotella fusca* Lane
*Ampedus ursinus* (Van Dyke)
*Anchastus cinereipennis* (Eschscholtz)
*Cardiophorus* spp. #1 to #5
*Cardiophorus tumidicollis*
*Ctenicera noxia* (Hyslop)
*Ctenicera pruinina* Horn
*Ctenicera semivittata* (Say)
*Horistonotus pilosus* Lanchester
*Hypolithus bicolor* (Eschscholtz)
*Limonius* (?) sp.
**Cantharidae**
*Malthodes* spp.
**Dermestidae**
*Dermestes marmoratus* Say
**Bostrichidae**
unident. sp. #1
**Cleridae**
*Enoclerus acerbus* Wolcott
*Enoclerus barri* Knull
*Phyllobanus* sp.
*Trichodes ornatus* Say
**Melyridae**
*Amecocerus* spp.
*Attalus glabrellus* Fall
*Attalus morulus smithi* Hopping
*Attalus oregonensis* Horn
*Collops bipunctatus* (Say)
*Collops bridgeri* Tanner
*Collops hirtellus* LeConte
*Collops punctulatus* LeConte
*Dasytellus* sp.
*Hoppingiana nitida* Hatch
*Neodasytes testaceous*
*Trichochrous paisleyi*
*Dasytes cruralis*
*Dasytellus nigricornis* (?) Bland
**Nitidulidae**
*Brachypterolous pulicarius* (L.)
*Carpophilus pallipennis* (Say)
**Cryptophagidae**
*Caenoscelis ferruginea*
*Cryptophagus cellaris*
**Phalacridae**
*Olibrus rufipes* LeConte
*Phalacrus penicilatus* Say
**Coccinellidae**
*Brachyacantha dentipes socialis* Casey
*Brachyacantha ursina uteella* Casey

(con.)

**Table 1—**(Cont.)

| ORDER<br>**Family**<br>Scientific name |
|---|
| *Brumus serptentrionis* Weise |
| *Coccinella difficilis* Crotch |
| *Coccinella guttata* Bennett |
| *Coccinella septempunctata* |
| *Coccinella novemnotata degener* Casey |
| *Coccinella prolongata* Crotch |
| *Coccinella transversoguttata richardsoni* Brown |
| *Hippodamia apicalis* Casey |
| *Hippodamia convergens* Guerin |
| *Hippodamia glacialis lecontei* Mulsant |
| *Hippodamia quinquesignata* Kirby |
| *Hippodamia tredecimpunctata tibialis* (Say) |
| *Hyperaspidius hercules* Belicek |
| *Hyperaspidius vittigera* LeConte |
| *Hyperaspis lateralis montanica* Casey |
| *Hyperaspis postica* LeConte |
| *Nephus ornatus* |
| *Nephus sordidus* (Horn) |
| *Psyllophora vigintimaculata* (Say) |
| *Selvadius nunemacheri* |
| *Selvadius* sp. #2 |
| *Scymnus ardelio* Horn |
| *Scymnus caurinus* Horn |
| *Scymnus marginicollis* Mannerheim |
| *Scymnus postpictus* Casey |
| **Latridiidae** |
| *Melanopthalma americana* Mannerheim |
| *Melanopthalma* sp. #2 |
| **Melandryidae** |
| *Physicus* sp. |
| unident. sp. #1 |
| **Mordellidae** |
| *Mordella atrata* Melsheimer |
| *Mordellistena aspersa* (Melsheimer) |
| *Mordellistena idahoensis* Ray |
| *Mordellistena sericans* Fall |
| **Tenebrionidae** |
| *Alaudes singularis* Horn |
| *Araeoschizus airmeti* Tanner |
| *Blapstinus barri* Boddy |
| *Blapstinus discolor* |
| *Blapstinus substriatus* Champion |
| *Coelocnemis punctatus* LeConte |
| *Coniontis obesa* LeConte |
| *Coniontis ovalis* (Say) |
| *Coniontis setosa* Casey |
| *Eleodes cordata* Eschscholtz |
| *Eleodes elongata* |
| *Eleodes extricata cognata* Haldeman |
| *Eleodes granulata* |
| *Eleodes hispilabris connexa* LeConte |
| *Eleodes humeralis* |
| *Eleodes nigrina* LeConte |
| *Eleodes novoverrucula* Boddy |
| *Eleodes obscura* Say |
| *Eleodes pilosa* Horn |
| *Eleodes rileyi* Casey |
| *Embaphion elongatum* Horn |
| *Eusattus muricatus* |
| *Helops californicus* Mannerheim |
| *Helops convexulus* LeConte |
| *Helops opacus* LeConte |
| *Melanstrus ater* (LeConte) |
| *Oxygonodera hispidula* (Horn) |
| *Sphaeriontis muricata* (Casey) |
| **Alleculidae** |
| *Mycetochara procera* Casey |
| **Meloidae** |
| *Epicauta immerita* Walker |
| *Epicauta normalis* Werner |
| *Epicauta piceiventris* Maydell |
| *Gnathium eremicola* Macswain |
| *Lytta vulnerata cooperi* LeConte |
| *Nemognatha lutea* LeConte |
| *Nemognatha scutellaris* |
| *Linsleya sphaericollis* (Say) |
| **Oedemeridae** |
| *Oxacis bicolor* (LeConte) |
| **Anthicidae** |
| *Anthicus cervinus* LaFerte |
| *Anthicus formicarius* LaFerte |
| *Anthicus hastatus* Casey |
| *Anthicus nanus* |
| *Notoxus serratus* LeConte |
| *Notoxus robustus* |
| *Notoxus* sp. #2 |
| **Cerambycidae** |
| *Centrodera nevadica nevadica* LeConte |
| *Cortodera barri* Linsley & Chemsak |
| *Crossidius ater* LeConte |
| *Crossidius coralinus* LeConte |
| *Crossidius hirtipes allgewahri* LeConte |
| *Crossidius punctatus* LeConte |
| *Judolia gaurotoides* Casey |
| *Mecas bicallosa* Martin |
| *Megacheuma brevipennis* (LeConte) |
| *Megasemum asperum* (LeConte) |
| *Micas bicallosa* |
| *Prionus californicus* Motschulsky |
| **Bruchidae** |
| *Acanthoscelides pauperculus* (LeConte) |
| *Acanthoscelides pudis* Fall |
| *Acanthoscelides* sp. #3 |
| **Chrysomelidae** |
| *Altica plicipennis* |
| *Anisostena californica* Van Dyke |
| *Brachycoryna montana* (Horn) |
| *Chaetocnema* sp. |
| *Crepidodera nana* (Say) |
| *Cryptocephalus spurcus* LeConte |
| *Dibolia borealis* Chevrolat |
| *Disonycha latifrons* Shaeffer |
| *Exema conspersa* (Mannerheim) |
| *Glyptina atriventris* Horn |
| *Glyptoscelis artemisiae* Blake |
| *Longistarsis oregonensis* |
| *Monoxia consputa* LeConte |
| *Monoxia pallida* Blake |
| *Monoxia puberula* Blake |
| *Pachybrachis caelatus* LeConte |
| *Pachybrachis jacobyi* Bowditch |
| *Phyllotreta albionica* LeConte |
| *Phyllotreta oregonensis* |

(con.)

**Table 1—**(Cont.)

| ORDER<br>**Family**<br>Scientific name |
|---|
| *Pseudoluporus longulus* LeConte |
| *Psylliodes punctulata* |
| *Pyrrhalta luteola* Muller |
| *Pyrrhalta nymphaeae* (L.) |
| *Saxinis saucia* LeConte |
| *Scelolyperus nigrovirescens* (Fall) |
| *Stenopodius flavidus* |
| *Stenopodius vanduzeei* Blaisdell |
| *Systena blanda* Melsheimer |
| *Trirhabda nitidicollis* LeConte |
| *Trirhabda* sp. #2 |
| **Curculionidae** |
| *Acmaegenius granicollis* Van Dyke |
| *Anthonomus tenuis* Fall |
| *Anthonomus squamosus* |
| *Apion sordidum* Smith |
| *Brachyrhinus ovatus* (L.) |
| *Cercopedeis artemisiae* (Pierce) |
| *Ceutorhinchus adductus* Dietz |
| *Ceutorhinchus bakeri* Hatch |
| *Ceutorhinchus disturbans* Dietz |
| *Ceutorhinchus* sp. #4 |
| *Cleonidius poricollis* |
| *Cleonus kirbyi* Casey |
| *Cleonus quadrilineatus* (Chevrolat) |
| *Cosmobarius americana* Casey |
| *Dinocleus denticollis* Casey |
| *Dyslobus alternatus* Horn |
| *Epimechus mimicus* Dietz |
| *Gyrotus sinuatus* Hatch |
| *Miloderoides maculatus* Van Dyke |
| *Myrmex vittatus* (Horn) |
| *Ophryastes latirostris* LeConte |
| *Sitona hispidula* (Fabricius) |
| *Sitona lineata* |
| *Smicronyx abnormis* |
| *Sphenophorus gentilis* LeConte |
| *Tostates cinerascens* |
| *Trachyphloeni* sp. |
| *Tychius tectus* LeConte |
| *Tychius mixtus* (?) Hatch |
| **Anthribidae** |
| *Trigonorhinus* sp. |
| **Anobiidae** |
| *Ptinis villiger* |
| *Xyletynus fucatus* LeConte |
| **SIPHONAPTERA** |
| **Ctenophthalmidae** |
| *Rectofrontia fraterna* |
| **Hystrichopsyllidae** |
| *Anomiopsyllus amphibolus* |
| *Callistopsyllus terinus* |
| *Catallagia decipiens* |
| *Epiledia stanfordi* |
| *Epiledia wenmanni* |
| *Hystrichopsylla occidentalis* |
| *Megarthroglossus divisus* |
| *Meringis hubbardi* |
| *Meringis parkeri* |
| *Phalacropsylla allos* |
| *Phalacropsylla paradisea* |
| *Rhadinopsylla sectilis* |

| ORDER<br>**Family**<br>Scientific name |
|---|
| *Stenistomera alpina* |
| *Stenistomera macrodactyla* |
| **Ceratophyllidae** |
| *Foxella ignota* |
| *Malaraeus bitterrootensis* |
| *Malaraeus euphorbi* |
| *Malaraeus telchinum* |
| *Megabothris abantis* |
| *Megabothris obscurus* |
| *Monopsyllus eumolpi* |
| *Monosyllus exilis* |
| *Monopsyllus wagneri* |
| *Opisocrostis labis* |
| *Opisocrostis tuberculatus* |
| *Opisodasys keeni* |
| *Orchopeas leucopus* |
| *Orchopeas sexdentatus* |
| *Thrassis bacchi* |
| *Thrassis francisi* |
| *Thrassis howelli* |
| *Thrassis pandorae* |
| **Leptopsyllidae** |
| *Amphipsylla siberica* |
| *Odontopsyllus dentatus* |
| *Peromyscopsylla hesperomys* |
| **Pulicidae** |
| *Cediopsylla inaequalis* |
| *Pulex irritans* |
| **DIPTERA** |
| **Tipulidae** |
| spp. undetermined |
| **Bibionidae** |
| *Bibio albipennis* |
| *Bibiodes* sp. |
| **Mycetophilidae** |
| *Bodetina* (?) sp. |
| *Fungivora* sp. |
| *Megalopelmna* (?) sp. |
| unident. spp. #1, #2 |
| **Sciaridae** |
| unident. spp. #1 to #4 |
| **Cecidomyidae** |
| *Rhopalomyia* sp. |
| unident. spp. #1 to #4 |
| **Psychodoidea** |
| spp. undetermined |
| **Scatopsidae** |
| *Scatopse fusipes* Meigan |
| **Dixidae** |
| unident. sp. #1 |
| **Culicidae** |
| *Aedes dorsalis* Meigan |
| **Simuliidae** |
| *Cnephia munus* D. & S. |
| *Simulium bivittatum* Malloch |
| *Simulium venator* D. & S. |
| *Simulium venustum* (?) Say |
| *Simulium vittatum* Zetterstedt |
| *Simulium* spp. #5, #6 |
| **Ceratopogonidae** |
| *Culicoides* sp. |

(con.)

**Table 1—**(Cont.)

| ORDER<br>**Family**<br>Scientific name | ORDER<br>**Family**<br>Scientific name |
|---|---|
| *Dasyhelea* spp. #1, #2 | **Micropezidae** |
| *Forcipomyia brevipennis* Macquaert | unident. spp. #1, #2 |
| *Forcipomyia* sp. #2 | **Psilidae** |
| **Chironomidae** | *Psila dimidiata* Loew |
| *Chironomus* spp. #1 to #3 | **Otitidae** |
| **Stratiomyiidae** | *Euxesta* (?) sp. |
| *Nemotelus canadensis* Loew | *Oedopa capito* Loew |
| **Therevidae** | *Physiphora demandata* (F.) |
| *Ozodiceromya* sp. | *Tritoxa cuneata* |
| *Psilocephala* spp. #1 to #3 | *Tritoxa pollinosa* Cole |
| *Thereva pseudoculata* Cole | **Tephritidae** |
| *Thereva semitaria* | *Aciurina ferruginea* Doane |
| **Scenopinidae** | *Aciurina luteana* Cresson |
| *Scenopinus* sp. | *Aciurina trixa* Cresson |
| **Asilidae** | *Aciurina* spp. #4, #5 |
| *Asilus occidentalis* Hine | *Euaresta tapetis* Coquillet |
| *Asilus mesae* | *Eutreta diana* |
| *Efferia benedicta* (Bromley) | *Eutreta oregona* Curran |
| *Efferia subcuprea* (Schaffer) | *Neaspilota* sp. |
| *Heteropogon senilis* Bigot | *Neotephrites finalis* (Loew) |
| *Holopogon seniculus* Loew | *Oxyna palpalis* Coquillet |
| *Lasiopogon* sp. | *Paroxyna clathrata* (Loew) |
| *Leptogaster fornicata* Martin | *Paroxyna corpulenta* Cresson |
| *Megaphorus martinorum* | *Paroxyna minima* Doane |
| *Ospriocerus abdominalis* (Say) | *Paroxyna steyskali* Novatny |
| *Stenopogon inquinatus* Loew | *Procecidochares minuta* Snow |
| *Stenopogon neglectus* | *Procecidochares* sp. #2 |
| **Bombyliidae** | *Tephritis araneosa* (Coquillet) |
| *Aphoebantus mormon* Melander | *Trupanea bisetosa* Coquillet |
| *Apolysis arenicola* | *Trupanea jonesi* Curran |
| *Exoprosopa caliptera* (Say) | *Trupanea nigricornis* Coquillet |
| *Geron* sp. | **Milichiidae** |
| *Lepidanthrax inauratus* (Coquillet) | *Leptometopa halteralis* Coquillet |
| *Lordotus apicalis* (Coquillet) | *Madiza glabra* (F.) |
| *Mythicomyia armata* | *Neophyllomyza quadricornis* Melander |
| *Mythicomyia atra* Cresson | *Pholeomyia indecora* Loew |
| *Mythicomyia rileyi* Coquillet | **Dryomyzidae** |
| *Mythicomyia* spp. #4 to #9 | unident. sp. #1 |
| *Oligodranes acrostichalis* Melander | **Sciomyzidae** |
| *Oligodranes quinquenotatus* | unident. spp. #1, #2 |
| *Phthirla sulphurea* | **Sepsidae** |
| *Prorates arctos* | *Saltella scutellaris* Fallen |
| *Prorates claripennis* Melander | *Saltella* sp. #2 |
| *Thyridantrax andrewsi* | *Sepsis biflexuosa* |
| *Toxophora virgata* Osten Sacken | *Sepsis neocynipsea* Melander & Spuler |
| *Toxophora* sp. | *Sepsis punctum* F. |
| *Villa molitor* Loew | **Lauxaniidae** |
| **Empididae** | *Camptoprosopella borealis* Shewell |
| *Drapetis* spp. #1 to #3 | **Chamaemyiidae** |
| *Platypalpus* sp. | *Leucopis americana* Malloch |
| **Phoridae** | *Leucopis flavicornis* Aldrich |
| *Megaselia* spp. #1 to #4 | *Pseudodinea nitens* Melander & Spuler |
| **Syrphidae** | unident. spp. #1 to #3 |
| *Eupeodes volucris* Osten Sacken | **Heleomyzidae** |
| *Scaeva pyrasti* (L.) | *Heleomyza* sp. |
| *Sphaerophoria philanthus* | *Pseudoleria* sp. |
| **Pipunculidae** | **Trixoscelidae** |
| *Tomosvaryella* sp. | *Trixoscelis* sp. |
| **Conopidae** | **Sphaeroceridae** |
| *Physocephala texana* (Willinston) | *Leptocera* sp. |
| *Thecophora propinqua* (Adams) | (con.) |
| *Zodion fulvifrons* Say | |

**Table 1—**(Cont.)

**ORDER**
**Family**
Scientific name

**Drosophilidae**
unident. sp. #1
**Ephydridae**
*Hydrellia griseola* (Fallen)
*Leptopsilota* sp.
*Mosillus bidentatus* Cresson
*Phylligria debilis* Loew
*Psilopa* sp.
**Chloropidae**
*Chlorops rubicundus* Adams
*Chlorops sordidellus*
*Conioscinella* sp.
*Goniopsita oophaga*
*Hippelates particeps* Becker
*Hippelates pusio* Loew
*Incertella* sp.
*Meromyza pratorum* Meigan
*Meromyza saltatrix* (L.)
*Neoneura flavifacies* Collin
*Neoneura polita* Sabrosky
*Olcella punctifrons* Becker
*Oscinella frit* (L.)
*Oscinella inserta* Becker
*Siphonella* sp.
*Thaumatomyia annulata* (Walker)
*Thaumatomyia appropinqua* (Adams)
*Thaumatomyia glabra* **(**Meigan)
**Anthomyiidae**
*Calythea micropteryx* Thomson
*Hydrophoria brunneifrons* (Zetterstedt)
*Hydrophoria divisa* (Meigan)
*Hylemyia* spp. #1 to #3
*Leucophora* sp.
*Pegomya* sp.
*Scatophaga stercoraria* (L.)
*Scatophaga* sp. #2
**Agromyzidae**
*Agromyza pusilla* Meigan
*Ceradontha dorsalis* Loew
*Melanagromyza* sp.
*Phytobia* sp.
unident sp. #5
**Scatophagidae**
unident. sp. #1
**Muscidae**
*Fannia* sp.
*Helina duplicata* (Meigan)
*Helina multisetosa*
*Helina troene* Walker
*Helina* spp. #3, #4
*Lasipcs septentrionalis* Stein
*Musca domestica* L.
*Muscina stabulans* Fallen
*Orthellia caesarion* (Meigan)
*Quadrolaria laetifica* Robineau-Desvoidy
*Schoenomyza dorsalis* Loew
**Calliphoridae**
*Calliphora lilae* Walker
*Phormia regina* (Meigan)
*Protophormia terrenovae* (Macquaert)
**Sarcophagidae**
*Hilarella hilarella* (Zetterstedt)

**ORDER**
**Family**
Scientific name

*Robineauella* sp.
*Sarcophaga* spp. #1 to #3
*Senotainia trilineata* (Wulp)
*Senotainia vigilans* Allen
*Sphenometopa tergata* Coquillet
*Taxigramma heteroneura* (Meigan)
**Cuterebridae**
*Cuterebra jellisoni*
**Tachinidae**
*Acemya tibialis* Coquillet
*Anthrycia cineria* (Coquillet)
*Anthrycia* sp.
*Bennettia compta* (Fallen)
*Blondelia* (?) sp.
*Catagoniops facialis* (Coquillet)
*Dinera grisescens* (Fallen)
*Euphorcera* sp.
*Exorista mella* Walker
*Gonia albagenae* Morrison
*Hyalomyia aldrichii* Townsend
*Lespesia archippivora* (Riley)
*Leucostoma simplex* Fallen
*Lydella radicis* Townsend
*Microchaetina valida* Townsend
*Norwickia latifacies* Tothill
*Norwickia latigena* Tothill
*Norwickia robinsoni*
*Paradidyma simulans* Townsend
*Paradidyma singularia* Townsend
*Patellea* sp.
*Peleteria malleola* Bigot
*Periscopsia cinerosa* Coquillet
*Periscepsia helymus* (Walker)
*Promasiphia* (?) sp.
*Siphosturmia maltana* Reinhardt
*Sitophaga* sp.
*Spallanzania* sp.
*Spathidexia reinhardti* Arnaud
*Stomatomyia parvipalpis* Wulp
*Voria ruralis* Fallen

**TRICHOPTERA**

**Leptoceridae**
spp. undetermined

**LEPIDOPTERA**

**Micropterigidae**
unident. spp. #1, #2
**Lyonetiidae**
*Bucculatrix seorsa*
*Bucculatrix tridenticola* Braun
**Coleophoridae**
*Coleophora* sp.
**Gelichiidae**
*Aroga websteri* Clarke
*Chionodes* sp.
**Tortricidae**
*Eucosma* sp.
*Phaneta salmicolorana*
*Phaneta setonana*
*Synnoma lynosyrana* Walsingham
**Plutellidae**
*Plutella maculipennis* Curtis

(con.)

**Table 1—**(Cont.)

| ORDER | ORDER |
|---|---|
| **Family** | **Family** |
| Scientific name | Scientific name |
| **Pterophoridae** | **HYMENOPTERA** |
| unident. sp. #1 | **Cephidae** |
| *Microlepidoptera* spp. #1 to #9 | *Cephus cinctus* Norton |
| **Pyralidae** | **Ceraphronidae** |
| *Loxostege commixtalis* | *Ceraphron* sp. |
| *Omnaptopteryx occellea* Hanson | unident. spp. #1, #2 |
| **Hesperiidae** | **Braconidae** |
| *Hesperia harpalus* (Edwards) | *Agathis californica* (?) Rhower |
| *Hesperia juba* (Scuder) | *Agathis gibbosa* Muesebeck |
| **Papilionidae** | *Apanteles* sp. #2 |
| *Papilio* sp. | *Apanteles yakutatensis* (Say) |
| **Pieridae** | *Aphidius* sp. |
| *Colias interior* | *Bracon hyslopi* (Viereck) |
| *Euchloe ausonides* Lucas | *Bracon nuperus* (?) Cresson |
| *Pieris beckerii* | *Bracon* spp. #3 to #5 |
| *Pieris protodice* Biusdyvak | *Chelonus* spp. #1, #2 |
| **Lycaenidae** | *Chorebus* sp. |
| *Lycaena helloides* Boisduval | *Diaeretiella* spp. #1, #2 |
| *Lycaena rubidus* | *Hormius* sp. |
| *Plebejus melissa* (Edwards) | *Macrocentrus ancylivorus* Rohwer |
| **Nymphalidae** | *Macrocentrus* sp. #2 |
| *Euphydryas anicia* (Doubleday) | *Meteorus leviventris* Wesmail |
| *Speyeria callippe nevadensis* (Edwards) | *Microplitis plutellae* Muesebeck |
| *Vanessa cardui* (L.) | *Microctonus pusillae* Muesebeck |
| **Satyridae** | *Opius* (?) sp. |
| *Cericyonis oetus oetus* (Boisduval) | *Orgilus* sp. |
| **Saturniidae** | *Rogas* sp. |
| *Hemileuca hera hera* Harris | *Tetrasphaeropyx* sp. |
| **Sphingidae** | *Vipio* (?) sp. |
| *Hyles lineata* (Fabricius) | unident. spp. #1 to #8 |
| *Proserpinus clarkiae* Boisduval | **Ichneumonidae** |
| **Arctiidae** | *Amblyteles* spp. #1, #2 |
| *Apantesis retilineata* | *Anomalon ejuncidum* Say |
| *Arctia caja* (L.) | *Anomalon* sp. |
| *Leparctia* sp. | *Banchus nubilus* Townes |
| **Geometridae** | *Campoplex* sp. |
| *Chlorosea* sp. | *Chorineaus* sp. |
| *Glaucina nephos* | *Conoblasta* sp. |
| *Pero modesto* | *Cryptus asymmetricus* Pratt |
| *Plataea linearia* | *Cryptus* sp. #2 |
| *Procherodes amplicineraria* Pearson | *Diadegma plutellae* (Viereck) |
| *Semiothisa nubiculata* | *Diadegma* sp. #1 |
| *Synaxis formosa* | *Diplazon laetitorius* (F.) |
| **Noctuidae** | *Exetastes* sp. |
| *Abagrotis nefascia* Smith | *Gelis* sp. |
| *Apamea occidens* (Grote) | *Gnypetonoipla* (?) sp. |
| *Aseptis characta* Grote | *Mesostenus gracilis* Cresson |
| *Autographa californica* Speyer | *Ophion abnormalis* Felt |
| *Copablepharon canariana* McDonald | *Ophion purgatus* Say |
| *Cucullia arizona* | *Pseudamblyteles superbus* (Provander) |
| *Dicestra crotchi* | *Pseudamblyteles kocheli* Swezey |
| *Drasteria mirifica* Hy. Edwards | unident. spp. #1 to #8 |
| *Euxoa auxiliaris* Grote | **Mymaridae** |
| *Euxoa costata idahoensis* Grote | *Gonatocerus* sp. |
| *Euxoa pluralis* Grote | unident. sp. #1 |
| *Faronta diffusa* (Walker) | **Trichogrammatidae** |
| *Heliothis belladonna* | unident. sp. #1 |
| *Lacinipolia* sp. | **Eulophidae** |
| *Rhynchagrotis exertistigma* Morrison | *Achrysocharella* sp. |
| *Synedoida* sp. | *Euderus* sp. |
| | *Chrysocharis* sp. |

(con.)

**Table 1—**(Cont.)

| ORDER<br>**Family**<br>Scientific name | ORDER<br>**Family**<br>Scientific name |
|---|---|
| *Cirrospilus* sp. | **Diapriidae** |
| *Diglyphus* spp. #1, #2 | unident. spp. #1, #2 |
| *Elachertus* sp. | **Scelionidae** |
| *Entedon* sp. | *Gaeus* sp. |
| *Necremnus duplicatus* Gahan | *Gryon* sp. |
| *Necremnus* sp. #2 | *Telenomus* spp. #1 to #3 |
| *Pediobius utahensis* (Crawford) | *Trissolcus utahensis* |
| *Tetrastichus coerulescens* Ashmead | **Platygasteridae** |
| *Tetrastichus* spp. #2 to #10 | *Platygaster rohweri* |
| *Zagrammosoma nigrolineatum* Crawford | *Platygaster utahensis* |
| *Zagrammosoma* sp. #2 | *Platygaster* spp. #2, #3 |
| unident. spp. #1 to #13 | *Synopeas* spp. #1 to #3 |
| **Elasmidae** | *Inostemma* sp. |
| *Elasmus* sp. | unident. sp. #1 |
| **Aphelinidae** | **Chrysididae** |
| unident. sp. #1 | *Ceratochrysis perpulchra* (Cresson) |
| **Encyrtidae** | *Ceratochrysis trachyplenia* R. Bohart |
| *Homalotylus* (?) sp. | *Chrysis canadensis* Buysson |
| *Oencyrtus* sp. | *Chrysis coerulans* (F.) |
| unident. spp. #1 to #15 | *Chrysis coloradica* |
| **Eupelmidae** | *Chrysis dorsalis* (?) Aaron |
| *Eupelmus allynii* French | *Chrysis vagabunda* |
| *Eupelmus* sp. #2 | *Chrysis* sp. #6 |
| *Calosota* sp. | *Chrysura densa* (Cresson) |
| unident. spp. #1 to #3 | *Cleptes purpuratus* |
| **Torymidae** | *Hedychridium carrilloi* R. Bohart & Brumley |
| *Torymus coloradensis* | *Omalus aeneus* |
| unident. spp. #1 to #11 | **Bethylidae** |
| **Pteromalidae** | unident. spp. #1, #2 |
| *Asaphes* sp. | **Dryinidae** |
| unident. spp. #1 to #37 | unident. sp. #1 |
| **Eutrichosomatidae** | **Sphecidae** |
| *Eutrichosoma mirabile* Ashmead | *Ammophila* spp. #1 to #3 |
| **Perilampidae** | *Ammoplanops* (?) sp. #1 |
| *Perilampus chrysopae* Crawford | *Ancistromma* sp. |
| *Perilampus hyalinus* Say | *Astata bakeri* Parker |
| *Perilampus similis* Crawford | *Belomicrus* sp. |
| *Perilampus* sp. #4 | *Bembix amoena* Handlirsch |
| **Eurytomidae** | *Bembix spinolae* Lepeletier |
| *Eurytoma* spp. #1 to #5 | *Cerceris minax* Mickel |
| *Harmolita* spp. #1, #2 | *Cerceris nigrescans* Simth |
| *Rileya cecidomyiae* Ashmead | *Dienoplus* sp. |
| *Tetramesa elymophaga* (Phillips) | *Diodontus* spp. #1, #2 |
| *Tetramesa* sp. #2 | *Dryudella immigrans* William |
| unident. spp. #1 to #4 | *Dryudella* sp. #2 |
| **Chalcididae** | *Ectemniis dilectus* Cresson |
| *Haltichella* sp. | *Ectemniis* sp. #2 |
| *Spilochalcis albifrons* Welsh | *Eucerceris* sp. |
| *Spilochalcis ignoides* (?) Kirby | *Glenostictia megacera* J. Parker |
| *Spilochalcis leptis* Burks | *Gorytes* sp. |
| *Spilochalcis side* Walker | *Mimesa* sp. |
| unident. sp. #1 | *Miscophus* (*Nitelopterus*) sp. |
| **Eucoilidae** | *Nyson* sp. |
| unident. sp. #1 | *Oxybelus* sp. |
| **Figitidae** | *Philanthus multimaculatus* Cameron |
| *Melanips coxalis* | *Podalonia* spp. #1, #2 |
| *Trischiza* sp. | *Prionyx canadensis* (Provancher) |
| **Cynipidae** | *Solierella* spp. #1 to #3 |
| *Periclistus* sp. | *Sphex ichneumoneus* (L.) |
| **Proctotrupidae** | *Steniolia elegans* J. Parker |
| *Proctotrupes florissantensis* Kiefer | *Stictella megacera* Parker |
| | *Tachysphex irregularis* |

(con.)

**Table 1—**(Cont.)

| ORDER<br>**Family**<br>Scientific name |
|---|
| *Tachysphex tarsatus* (Say) |
| *Tachysphex williamsi* |
| **Melittidae** |
| unident. sp. #1 |
| **Colletidae** |
| *Colletes dissoptus* Timberlake |
| *Colletes fulgidus* Swank |
| *Colletes lutzi* Timberlake |
| **Halictidae** |
| *Agapostemon texanus* Cresson |
| *Dialictus* spp. #1, #2 |
| *Evylaeus* sp. |
| *Halictus farinosus* Smith |
| *Halictus ligatus* |
| *Halictus tripartitus* Cockerell |
| *Sphecodes arvensiformis* (?) Cockerell |
| *Sphecodes* sp. |
| **Andrenidae** |
| *Andrena prunorum* Cockerell |
| *Descurainia richardsoni* |
| *Perdita* spp. #1, #2 |
| **Megachilidae** |
| *Anthidium emarginatum* (Say) |
| *Anthidium placitum* Cresson |
| *Anthidium utahense* Swenk |
| *Ashmeadiella gillettei* Titus |
| *Ashmeadiella opuntiae* Cockerell |
| *Dianthidium pudicum decorum* Timberlake |
| *Dioxys pomonae* Cockerell |
| *Hoplitis producta* Michner |
| *Megachile laurita* Mitchell |
| *Megachile onobrychidis* Cockerell |
| *Megachile parallela* Smith |
| *Osmia integra* |
| *Stelis* sp. |
| **Anthophoridae** |
| *Anthophora exigua* Cresson |
| *Anthophora ursina* Cresson |
| *Ceratina pacifica* Cresson |
| *Didadasia enavata* Cresson |
| *Epeolus minimus* Robertson |
| *Melissodes bimatris* (?) LaBerge |
| *Nomada articulata* Smith |
| *Nomada suavis* Cresson |
| *Synhalonia* spp. #1, #2 |
| *Tetralonia fulvitarsis* Cresson |
| *Triepeolus helianthi* (?) Robertson |
| **Apidae** |
| *Apis mellifera* (L.) |
| *Bombus fervidus* (F.) |
| *Bombus huntii* Greene |
| **Tiphiidae** |
| *Brachycistis* spp. #1, #2 |
| **Sapygidae** |
| *Sapyga pumila* Cresson |
| *Tiphia* sp. |
| **Mutillidae** |
| *Chyphotes* sp. |
| *Sphaerophthalma unicolor* |
| *Sphaerophthalma* spp. #2 to #4 |
| **Scoliidae** |
| *Campsoscolia alcione* Banks |

| ORDER<br>**Family**<br>Scientific name |
|---|
| **Formicidae**[d] |
| *Camponotus hyatti* Emery |
| *Camponotus vicinus* May |
| *Camponotus* sp. #2 |
| *Ephebomyrmex* sp. |
| *Formica ciliata* Mayr |
| *Formica cinerea canadensis* Santschi |
| *Formica fusca L.* |
| *Formica gynocrates* Snelling and Buren |
| *Formica haemorrhoidalis* Emery |
| *Formica hewitti* Wheeler |
| *Formica lasioides* Emery |
| *Formica laviceps* Creighton |
| *Formica manni* Wheeler |
| *Formica montana* |
| *Formica neogagates* Emery |
| *Formica obscuriventris* |
| *Formica obtusopilosa* Emery |
| *Formica oreas comptula* Wheeler |
| *Formica rufa* (L.) |
| *Formica subnuda* |
| *Formica subpolita* Mayr |
| *Formica whymperi* |
| *Formicoxenus diversipilosus* |
| *Formicoxenus hirticornis* |
| *Lasius alienus* |
| *Lasius crypticus* Wilson |
| *Leptothorax andrei* |
| *Leptothorax nevadensis* Wheeler |
| *Liometopum luctuosum* W. M. Wheeler |
| *Manica mutica* |
| *Monomorium minimum* |
| *Myrmecocystus mojave* |
| *Myrmecocystus testaceus* Emery |
| *Myrmica americana* Weber |
| *Myrmica lobicornis* Emery |
| *Pheidole californica* |
| *Pogonomyrmex occidentalis* (Cresson) |
| *Pogonomyrmex owyheei* Cole |
| *Pogonomyrmex salinus* Olsen |
| *Solenopsis molesta* Say |
| *Stenamma* sp. |
| *Tapinoma sessile* Say |
| *Veromessor lobognathus* (Andrews) |
| **Pompilidae** |
| *Ageniella* spp. #1, #2 (?) |
| *Anoplius insolens* |
| *Anoplius tenebrosus* (Cresson) |
| *Anoplius* sp. #3 |
| *Aporinellus completus* Banks |
| *Aporinellus fasciatus* (Smith) |
| *Ceropales* sp. |
| *Episyron snowi* (Viereck) |
| *Evagetes padrinus* (?) (Viereck) |
| *Evagetes parvus* |
| *Evagetes* sp. #3 |
| *Pompilus angularis* (Banks) |
| **Vespidae** |
| *Ancistrocerus* spp. #1, #2 |
| *Euodynerus annulatus* (Say) |
| *Euodynerus* sp. #2 |

(con.)

**Table 1—**(Cont.)

| ORDER[a] |
|---|
| **Family**[a] |
| Scientific name[b] |
| *Pterocheilus fasciatus* Say |
| *Pterocheilus pediculatus* |
| *Pterocheilus provancheri* |
| *Stenodynerus noticeps* (?) |
| *Stenodynerus* sp. #2 |

[a] Order and Family names are according to Borror and others (1992).
[b] Spellings are according to Horning and Barr (1970), Haws and others (1988), and Arnett (2000). Authors are provided only in cases where they were available from literature cited in the reference list. Authors shown in parentheses indicate the generic name has changed since the species was originally identified (Borror and others 1992). Abbreviations: sp. = single species (Borror and others 1992), spp. = multiple species (Borror and others 1992), unident. = unidentified species or morphospecies, undetermined = specimens were not identified past family level, (?) = questionable identification noted by the researcher.
[c] Subsequently identified as *O. annulata*.
[d] Additional taxa and clarifications pending (Clark and Blom, in preparation).

with specific hostplants or particular insect groups. In most cases, only a few dozen species were collected and identified. The investigation by Bohart and Knowlton (1977), in which over 800 species were identified, constitutes the most extensive single inventory conducted at the INL, followed by the study by Karr and Kimberling (2003) and the multiple-year investigation conducted by Stafford (1983, 1987) and Stafford and Johnson (1986).

In comparison, a 3-year survey at nearby Craters of the Moon National Monument (CMNM) (Horning and Barr 1970) resulted in the identification of nearly 2,100 species, representing 248 families and 1,144 genera in 19 orders. Totals for the suborder Raphidoidea were reported separately in the summary of COM insect orders by Horning and Barr (1970); for the INL list, species Raphidoidea are included in totals reported for Neuroptera (see table 2). Although about 860 more insects were documented in the CMNM survey, only 157 of the 212 families, 396 of 747 genera, and 305 of 1,241 species identified at the INL have also been identified at CMNM. Insects in disturbed habitats at the INL have been investigated (Karr and Kimberling 2003; Wenninger 2001), but studies have been primarily in native sagebrush and grassland. While similar communities were included in the CMNM survey, the larger inventory likely reflects investigation of a wider variety of habitat types (Horning and Barr 1970) and greater nighttime collecting efforts.

Insect research at the INL has been focused on terrestrial species. However, a few aquatic insect families have been documented in and around industrial waste ponds (Cieminski and Flake 1995; Millard and others 1978). Additional aquatic insects have been collected from sections of the Big Lost River, but specimens have not been sorted and identified (R. C. Rope, personal communication).

In recent years, large wildfires at the INL have destroyed thousands of acres of sagebrush habitat, including several former research sites (fig. 1). The response of insects to fire has been studied at the INL (Stafford 1983, 1987; Winter 1994), but as the need for restoration of sagebrush habitats damaged by fire and other disturbance increases, a greater understanding of insect life cycles, population dynamics, and changes in species composition over time will be required. This baseline list of insects can be used to identify groups that have not been well characterized and will help focus further investigation of insect ecology and function in natural and restored sagebrush systems.

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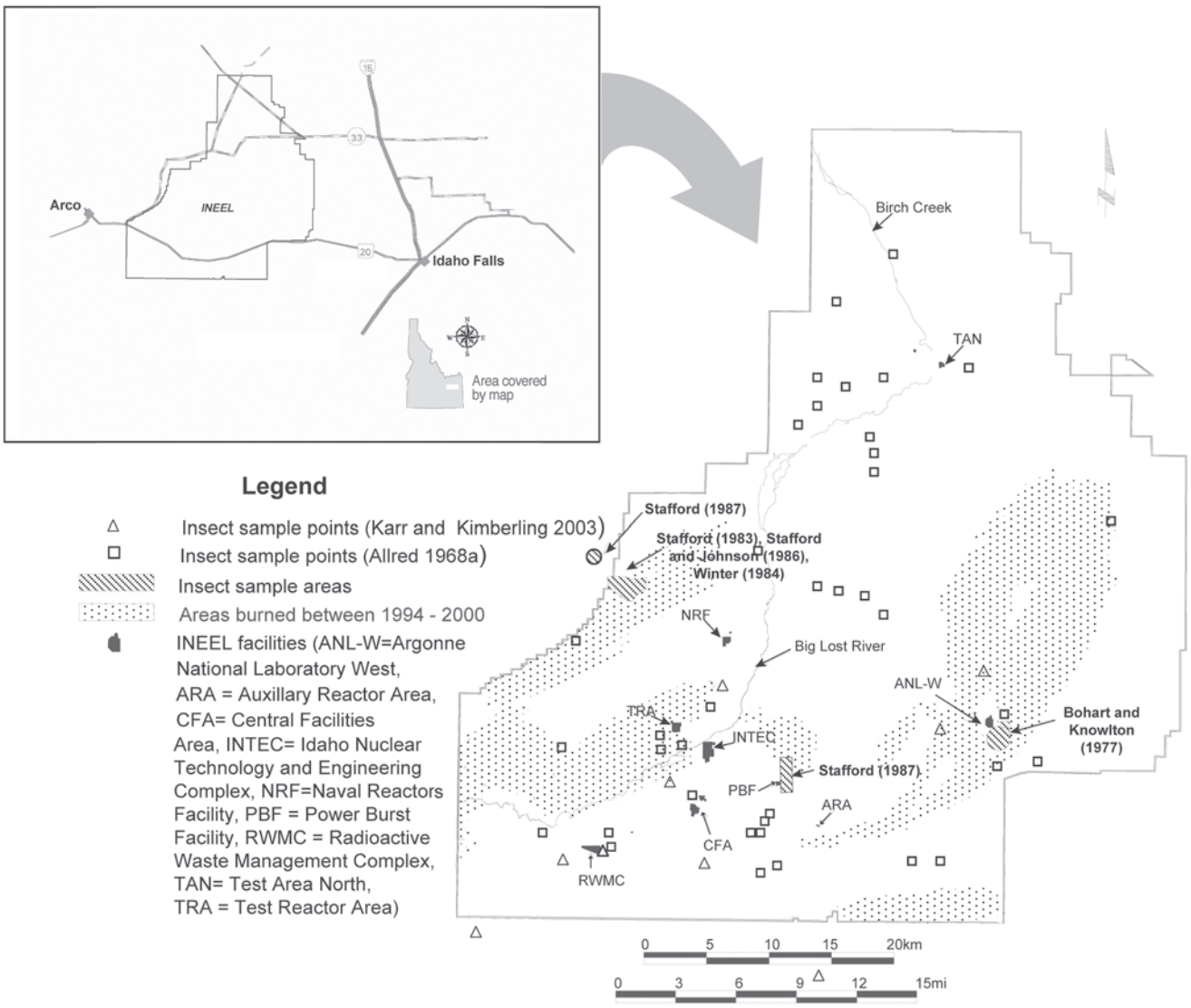


**Figure 1**—Sampling locations for major insect studies at the INL. NOTE: the INEEL is now the Idaho National Laboratory (INL); the TRA is now the Reactor Technology Complex (RTC); and the ANL-W is now the Materials and Fuels Complex (MFC).

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**Table 2—**Summary of insect inventories for the Idaho National Laboratory and Craters of the Moon National Monument.

| | Families | | Genera | | Species | |
|---|---|---|---|---|---|---|
| Order | INL[a] | CMNM[b] | INL | CMNM | INL | CMNM |
| Collembola[c] | 4 | 5 | _ | 6 | _ | 6 |
| Thysanura | _ | 2 | _ | 2 | _ | 2 |
| Ephemeroptera[c] | 2 | 4 | _ | 4 | _ | 4 |
| Odonata | 3 | 4 | 3 | 6 | 3 | 10 |
| Isoptera | 1 | 1 | 1 | 1 | 1 | 1 |
| Plecoptera | _ | 4 | _ | 4 | _ | 5 |
| Dermaptera | _ | 1 | _ | 1 | _ | 1 |
| Psocoptera | 1 | 2 | 1 | 3 | 1 | 3 |
| Phthiraptera | 4 | _ | 9 | _ | 20 | _ |
| Orthoptera | 4 | 4 | 8 | 14 | 11 | 23 |
| Hemiptera | 17 | 20 | 63 | 79 | 79 | 115 |
| Homoptera | 13 | 14 | 49 | 56 | 65 | 79 |
| Thysanoptera | 4 | 3 | 7 | 8 | 9 | 10 |
| Neuroptera | 5 | 5 | 9 | 14 | 10 | 24 |
| Coleoptera | 42 | 44 | 187 | 198 | 297 | 324 |
| Strepsiptera | _ | 1 | _ | 1 | _ | 1 |
| Siphonaptera | 4 | _ | 24 | _ | 38 | _ |
| Diptera | 46 | 50 | 159 | 286 | 238 | 521 |
| Trichoptera[c] | 1 | 6 | _ | 10 | _ | 12 |
| Lepidoptera | 18 | 35 | 49 | 140 | 66 | 218 |
| Hymenoptera | 43 | 43 | 178 | 311 | 403 | 705 |
| Totals | 212 | 248 | 747 | 1,144 | 1,241 | 2,064 |

[a] Idaho National Laboratory.
[b] Craters of the Moon National Monument (totals from Horning and Barr 1970).
[c] INL specimens were not identified past family level for these orders.


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