RICHMOND FIELD STATION LEPIDOPTERA

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The following list records about 101 species, members of 28 families, of moths and butterflies that were observed at the University of California, Richmond Field Station (RFS), and adjacent bay shore, Contra Costa Co., CA, February to June and late August to November, 1992-94. Observations were made during 28 daytime visits of 1-3 hrs each, by J. A. Powell or Y.-F. Hsu. Larvae, leaf mines, or galls were recorded for 48 species (47.5%), adults only for the remainder.

Projected fauna.-- Based on the number of native plants recorded (54 species in 46 genera) and butterfly species observed, 22 (18 probably resident, mostly feeding on weedy plants), I estimate that 150-200 species of Lepidoptera may inhabit RFS. A thorough inventory would depend in part on nocturnal sampling by UV lights, through all seasons over a several year period. Such a census in a site the size and configuration of RFS, however, would include an unknowable number of vagrant species, from outside the Station.

Larval hostplant relationships.-- Among 89 species thought to be resident at RFS, larvae or larval mines of 48 (54%) were discovered; larval foods of 33 others can be extrapolated with confidence, based on knowledge from other populations; likely hostplant associations were observed at RFS for 4 of the remaining 8. Hence, larval foods of 91% are accounted for, 95% including those projected from adult-plant associations.

Larvae of 35 species are recorded feeding on 15 genera of native plants, and about 13 generalist or introduced specialist Lepidoptera on 10 genera of exotic plants. At least 30 species are recorded feeding, or are presumed to feed on Asteraceae (33% of the resident Lepidoptera); 10 species probably feed on Poaceae (11%).

While obviously not completely inventoried, this appears to be a relatively depauperate lepidopterous fauna, considering the known flora (120 plant species, 55% exotic). This relationship could be predicted from the architecture of the plant community and the disproportionate representation of exotic plants. In general, trees support the largest numbers of phytophagous insects, followed by shrubs, larger forbs, and annual herbs and monocots with the fewest. For example, at the Antioch National Wildlife Refuge in eastern Contra Costa County, there are 110 native plant species in the perturbed community, and these harbor 35 species of butterflies and at least 134 species of smaller moths (microlepidoptera), contrasted with 18 and 44, respectively, known at RFS. At Antioch, about half the microlepidoptera feed on 7 species of woody plants, and oaks and willows support 31% of the small moths. At RFS, there are generic counterparts of only 4 of those plants, and only Baccharis and Salix fill a dominant role of the woody superstructure, harboring 9 and 5 species respectively (15.7% of the resident Lepidoptera). At least 37 of the resident species (42%) are generalist feeders and/or depend upon weedy plants at this site, or are detritivores, a reflection of the weediness of the community.

Rare and biologically significant species.-- At least six species of smaller moths are noteworthy, their populations representing new records for the East Bay area and/or providing potentially new larval hostplant associations.

1. Coleophora species near annulicola Braun

We reared this moth from case-bearing larvae on Aster; I had not seen the species previously. J.-F. Landry at Ottawa, who is currently studying the group, believes this to be undescribed near or conspecific with C. annulicola, which is previously known only from Utah. We also found the RFS species at Brooks Island in 1993.

2. Heliodines extraneella Walsingham.

This is the first known occurrence of H. extraneella in the Contra Costa County. The larvae mine leaves of Epilobium dasycarpum at RFS, and use E. (Zauschneria) in Yolo Co. and E. (Boisduvalia) in San Mateo Co.

3. Eucosma conspiciendana (Walsingham)

This species was taken at lights in the East Bay in the 1950's (Bear Creek near Orinda, now at the bottom of Briones Reservoir); adults taken in close association with Aster at RFS provide the first clue to the larval biology, but the site in the south field of coastal prairie was destroyed by grading in early October, 1992.

4. Phaneta corculana (Zeller)

This species was described originally from Vancouver Island and has remained poorly known. It has been recorded in more boreal parts of California but not in low coastal areas previously. Adults were associated with Wyethia, which provides the first suggestion of its larval biology.

5. Phaneta pallidarcis (Heinrich)

One adult was taken in June and larvae in April from Artemisia californica, growing on the railroad bed that crosses the salt marsh, a hostplant association that has been suspected for pallidarcis elsewhere. This species has not been recorded on the coast north of Monterey County previously.

6. Anatralata versicolor (Warren)

This diurnal moth has a wide range in the mountains, from British Columbia to the Sierra Nevada, mostly at higher elevations. We have two recent records in serpentine grasslands in Alameda and San Mateo counties, and now in coastal prairie at RFS, perhaps a relict of once more extensive occurrence at low elevations. The adults were taken in close association with Wyethia, the first indication of a hostplant relationship for this or related genera.

LIST OF THE OBSERVED LEPIDOPTERA

(Abbreviations: **e**=exotic species, **n**=native; **r**=resident, **v**=vagrant; **ad**=adult observed, **la**=larvae or larval mines, galls observed; **II-XI**, February to November. Larval collections designated by year-month lot numbers, e.g. 92B7= 7th collection in February, 1992. *=association with exotic or weedy larval hostplant.

NEPTICULIDAE

Stigmella heteromelis Wilkinson & Scoble n, r

ad: la: mines Heteromeles arbutifolia (abandoned II, 92B..).

The plants on which mines were observed were destroyed by grading in October, 1992.

Stigmella sp. n, r

ad: not observed ; la: leaf miner on Salix lasiolepis (abandoned mines IX, 92J..)

HELIOZELIDAE

Coptodisca saliciella (Clemens) n, r

ad: VII, diurnal; la: abundant leaf miner on Salix lasiolepis, VI (92F10)

TINEIDAE

Amydria sp. n, r

ad: IV, IX la: detritivore, possibly in mammal burrow

GRACILLARIIDAE

Cremastobombycia sp. 1 n, r

ad: III la: leaf mines on Grindelia humilis, II, III, IV, VI (92B7, 92C10, 92F14, 93D19)

Cremastobombycia sp. 2 n, r

ad: IV, IX la: mines leaves of Baccharis pilularis, III, VI (92C8.1, 92F13)

Marmara sp. n, r*

ad: la: mines stems of Rubus (abandoned II, 92B). The colony was extirpated by grading in October, 1992, although there is another just across the slough on private land.

BUCCULATRICIDAE

Bucculatrix variabilis Braun n, r

ad: IV, nocturnal la: mines first, then feeds externally, on Baccharis pilularis, II (92B4, 92D44).

Bucculatrix sp. n, r

ad: VI la: likely a skeletonizer on Artemisia californica

OECOPHORIDAE

Agonopterix alstroemeriana (Clerck) e, v

ad: IX la: leaf roller on Conium maculatum.

Borkhausenia nefrax Hodges e, r

ad: XI (multivoltine) la: detritivore

BLASTOBASIDAE

Hypatopa sp. n, r

ad: IV, V, IX la: probably a generalist detritivore, at RFS feeds in dry seed of Rumex, II (92B2)

COLEOPHORIDAE

Batrachedra salicipomonella Clemens n, r

ad: VI-VIII, X, nocturnal; la: in Salix leaf galls caused by the sawfly, Pontania californica (Tenthredinidae), IV, VI, IX (92D60, 92F12, 93J37).

Coleophora tildeni Landry ms n, r

ad: VIII, IX; la: case bearer on Baccharis pilularis, II-VI (92B4.1, 92C80, 92D43, 92D61, 92F13); some of the larval collections refer to the following species (adults not reared).

Coleophora baccharella Landry ms n, r

ad: IX la: case bearer on Baccharis pilularis

Coleophora nr. annulicola Braun n, r

ad: IV; la: case bearer on Aster, III, IX (92C5, 94J18)

MOMPHIDAE

Mompha sp. 1 n, r

ad: IX ; la: unknown.

Mompha sp. 2 n, r

ad: X la: leaf and bud miner on Epilobium dasycarpum, IX (92J37, 93J8, 94J21).

SCYTHRIDIDAE

Neoscythris confinis (Braun) n, r

ad: X ;la: unknown.

GELECHIIDAE

Aristotelia argentifera Busck n, r

ad: V, nocturnal; la: tip webber on Baccharis pilularis, IV (92D43, 93D21).

Chionodes ochreistrigella (Chambers) n, r*

ad: V,VI, VII, X nocturnal; la: external feeder on Rumex crispus, IV, VI, IX (92D65, 92F7, 94J17).

Chionodes sp.? n, r

ad: VI la: unknown

Gnorimoschema baccharisella Busck n, r

ad: IX la: stem gall maker on Baccharis pilularis, abandoned II, immature III (92B3), V (92E236).

Gnorimoschema subterranea Busck n, r

ad: IX, X la: in stem gall on Aster, III-V (92C6, 92E236)

Unplaced sp. 1 n, r

ad: la: leaf tier on Grindelia humilis, III (92C9, 92C25)

Scrobipalpula psiliella complex n, r

ad: IV, IX; la: tip borer in Gnaphalium, III (92C11).

PLUTELLIDAE

Plutella xylostella (L.) e, r*

ad: VI la: external feeder on Lepidium & other weedy crucifers

HELIODINIDAE

Heliodines extraneella Walsingham n, r

ad: IV, IX-X, diurnal; la: leaf miner on Epilobium dasycarpum, IX (92J37, 93J7, 94J21.1).

CHOREUTIDAE

Tebenna gnaphaliella (Kearfott) n, r*

ad: IX, X diurnal, assoc. Gnaphalium luteo-album; la: tip borer on Gnaphalium

SESIIDAE

Synanthedon bibionipennis (Boisduval) n, r*

ad: V,VI, diurnal wasp mimic; la: stem borer in Rubus. The observed colony was extirpated by grading in October, 1992

TORTRICIDAE

Olethreutinae

Epiblema strenuana (Walker) coastal strand race n, r

ad: III, VI-VIII la: stem borer in Ambrosia chamissonis, VI (92F15)

Epinotia columbia (Kearfott) n, r

ad: IV, V, nocturnal; la: tip tier on Salix lasiolepis, III (92C26), IV (93D18).

Epinotia infuscana (Walsingham) n, r

ad: IV; la: stem borer in Lupinus arboreus, III (92C23)

Eucosma conspiciendana Heinrich n, r

ad: V, assoc. Aster; la: probably a root borer in Aster. The observed colony was destroyed by grading in October, 1992.

Phaneta corculana (Zeller) n, r

ad: IV, assoc. Wyethia; la: probably a stem borer

Phaneta pallidarcis (Heinrich) n, r

ad: emgd. late V, VI la: tip borer in Artemisia californica, IV (93D20)

Cydia prosperana (Kearfott) n, r

ad: IV, diurnal; la: probably a seed borer in Lupinus

Tortricinae

Acleris hastiana (L.)

ad: VII la: leaf tier on Salix lasiolepis, VI (92F11)

Acleris senescens Zeller n, r

ad: IX-X ;la: leaf roller on Salix lasiolepis, IV (93D18.1)

Argyrotaenia citrana (Fernald) n, r

ad: II, III, IV, assoc. Baccharis, multivoltine; la: general feeder, found on Erodium

at RFS, V (92E42).

Clepsis peritana (Clemens) n, r
ad: IV, IX, X multivoltine, nocturnal la: general feeder, especially on low herbs

Platynota stultana (Walsingham) e, r
ad: III-X, multivoltine, nocturnal; la: general feeder, found at RFS on Aster III, IX, Grindelia IV, Wyethia V, Ambrosia VI, Rumex VI, Epilobium IX, plant #1771 IX (92E237,F7, F15, J37, J41, 93C3, D19.1, J8.1, 94J14, J22)).

CRAMBIDAE

Achyra occidentalis (Packard) e, v?
ad: IX, nocturnal; la: general feeder on low herbs

Agriphila anceps (Grote) n, r
ad: IX,X, abundant in prairie; la: sod webworm in bunchgrass

Agriphila attenuata (Grote) n, r
ad: X, abundant in prairie; la: sod webworm in bunchgrass

Anatralata versicolor (Warren) n, r
ad: IV, diurnal, assoc. Wyethia; la: unknown

Crambus occidentalis Grote n, r
ad: IX ;la: sod webworm on Poaceae

Crambus sperryellus Klots e, r
ad: IX, nocturnal; la: in grass sod

Dicymolomia metaliferalis (Packard) n, r
ad: V, VI, IX, nocturnal; la: scavenger, case-bearer

Diastictis fracturalis (Zeller) n, r
ad: IV, IX; la: in terminals of Gnaphalium and other Asteraceae.

Hellula rogatalis (Hulst) e, r*
ad: VI, IX-XI la: leaf miner first, then external feeder on Brassica, XI (92L2) and probably Lepidium.

Nomophila nearctica Munroe n, r
ad: IX ;la: grass feeder

Pyrausta subsequalis (Guenee) n, r
ad: II-V, IX-XI la: stem borer of Asteraceae

Udea profundalis (Packard) n, r*
ad: III, IV, VI, IX, X la: leaf tier, general feeder on herbs

Uresiphita reversalis (Guenee) e, r*
ad: II, III, VI, VIII, IX, nocturnal but flies readily during day upon disturbance; la: colorful, exposed caterpillar on Cytisus monspessulanus (92F16), defoliating it by fall, and on Lupinus arboreus, II, XI (92B8, L4).

PYRALIDAE

Ephestiodes gilvescentella Ragonot n, r
ad: IX la: detritivore

Homoeosoma electellum (Hulst) n, r

ad: IX la: in flower heads of Asteraceae

Hulstia undulatella (Clemens) e, r?
ad: IX la: polyphagous foliage feeder on low herbs

Lipographis fenestrella (Packard) n, r
ad: VIII, IX, abundant assoc. Distichlis; la: unknown; recorded elsewhere on Cordylanthus (Scrophulariaceae)

Phycitodes mucidellum (Ragonot) n, r
ad: V, IX-X la: feeds in flower heads of Asteraceae, at RFS on Aster IX (94J18.1)

PTEROPHORIDAE

Emmelina monodactyla (L.) e, r*
ad: V la: external feeder on Convolvulus arvensis, IV, V (92D108, 92E43)

Oidaematophorus grandis (Fish) n, r
ad: VII, VIII, nocturnal; la: stem borer in Baccharis pilularis, III- VI (92C7, 92F8)

Platyptilia williamsi Lange n, r
ad: III la: on Gnaphalium, II (92B10)

GEOMETRIDAE

Elpiste marcescaria (Guenee) n, r
ad: III, IV, VI la: external feeding inchworm on Baccharis pilularis

Eupithecia miserulata Grote n, r
ad: X nocturnal la: flowerhead feeder on Aster IX (94J18.2)

Perizoma custodiata (Guenee) n, r
ad: III, IV, VI, VIII-XI; la: external feeder on Chenopodiaceae, at RFS apparently on Salicornia.

Spargania magnoliata Guenee n, r
ad: X mulivoltine, nocturnal la: external feeder on Onagraceae, at RFS on Epilobium dasycarpum IX (94J21.2)

Synaxis truxaliata complex n, r
ad: VI, nocturnal; la: stick mimic inchworm on Baccharis pilularis

ARCTIIDAE

Estigmene acrea (Drury) n, r*
ad: nocturnal la: general feeder, found at RFS on Melilotus indica, V (92E238).

NOCTUIDAE

Autographa californica (Speyer) n, r*
ad: III, V la: cutworm, general feeder, on Melilotus indica at RFS, IV (92D62).

Caenurgina erechtea (Cramer) n, r
ad: IV la: reported on grasses and other herbs

Euxoa messoria (Harris) n, r
ad: IX (newly emerged); la: generalist on low herbs

Heliothis phloxiphaga Grote & Robinson n, r

ad: X la: general feeder. at RFS on flower heads of Grindelia humilis, IX (92J6).

Homoglaea dives Smith n, r
ad: XI ;la: leaf tier on Salix lasiolepis, IV (93D17)

Lacinipolia pensilis (Grote) n, r?
sd: IX la: general feeder on herbs and shrubs

Leucania oregona Smith n, r
ad: V la: reported on grasses

Spodoptera exigua (Hubner) e, r*
ad: V; la: general feeding cutworm, at RFS found on an unidentified monocot, IV (92D66).

Tricholita fistula Harvey n, r
ad:IX la: generalist on shrubs, at RSF in terminal of Grindelia humilis, IV (92D64).

Zale lunata (Drury) n, r?
ad: IX la: generalist on broadleaf shrubs, often Salix

HESPERIIDAE

Hylephila phyleus (Drury) e, r*
ad: IV, IX, X la: lawn grass

Paratrytone melane (Edwards) n, r
ad: IV, IX la: Poaceae

Polites sabuleti (Boisduval) n, r
ad: IV, V, VI, IX, common assoc. Distichlis near the beach; la: Poaceae (native)

Pyrgus communis (Grote) n, r*
ad: IV, IX-XI la: leaf tier on Malva (weedy) and Sida hederacea IX (94J19)

PAPILIONIDAE

Battus philenor (L.) n, v
ad: IV ; la: on Aristolochia

Papilio zelicaon Lucas e, r*
ad: III, V, VI, IX, emged. XI; la: external feeder on Foeniculum vulgare, IV, VIII, IX (92D.., 92J.., 93J38)

PIERIDAE

Pieris rapae (L.) e, r*
ad: II-X la: external feeder on weedy Brassicaceae

Colias eurytheme Boisduval n, v
ad: III, IV, V, IX, X la: on Fabaceae

Euchloe ausonides (Lucas) n, r*
ad: IV, oviposition on Brassica; la: exposed, on Brassica inflorescence

LYCAENIDAE

Lycaena helloides (Boisduval) n, r*
ad: IX, on higher ground in the salt marsh area la: external feeder on Rumex IX

(94J16)

Lycaena xanthoides (Boisduval) n, r*
ad: V, VI la: external feeder on Rumex leaves

Strymon melinus Hubner n, r*
ad: VI, IX la: general feeder on buds and flowers, at RFS on inflorescence of Limonium, IX (92J33)

Brephidium exile (Boisduval) e, r
ad: IX ;la: on Chenopodiaceae, probably Atriplex semibaccata at this site

Plebeius acmon (Westwood & Hewitson) n, r
ad: IX; la: feeds on Eriogonum and legumes, probably on a weedy Lotus at this site

NYMPHALIDAE

Danaus plexippus (L.) n, r
ad: overwintering aggregations in Eucalyptus, II, occasional individuals III, IV, IX, X; la: external feeder on Asclepias (winter resident but not breeding at RSF)

Junonia coenia (Hubner) n, r*
ad: II, IV, V, VI, IX, X la: on Plantago

Phyciodes mylitta (Edwards) n, r
ad: IX ;la: foliage feeder on Asteraceae

Vanessa annabella Field n, r*
ad: III, VI, IX la: leaf tier on Malva

Vanessa atalanta (L.) n, v
ad: II la: on Urtica and weedy Parietaria

Vanessa cardui (L.) n, v
ad: IV-VI, IX, migrant; la: generalist

Vanessa virginiensis (Drury) n, r
ad: IX la: inflorescences of Gnaphalium, IX (93J38)

SATYRIDAE

Coenonympha california Westwood n, r
ad: IV, VI, IX ; la: on Poaceae (93C2)