LEPIDOPTERA (BUTTERFLIES AND MOTHS) OF BROOKS ISLAND, CALIFORNIA

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Brooks Island is situated in San Francisco Bay, less than a mile from the Richmond Marina and about a quarter mile from Point Potrero on the northeast shore of the bay. Nonetheless the island has remained relatively secluded from casual visitors through a history of private ownership and guarded by surrounding mud flats that prevent boat access except during higher tide hours. The main island consists of a rocky ridge of Franciscan chert and is about 47 acres (22 ha) in area, rising to 160 feet (49 m) at the south end of the ridge, where it abruptly drops into a bowl representing the remnants of intermittent quarry operations prior to 1938. The island was purchased by a construction company about 1920 and was used as a quarry. Rock was removed for landfill at Treasure Island, San Quentin, and other bay projects and to construct a breakwater that protects the channel leading into the Richmond inner harbor. The breakwater, which was constructed in the 1920s, extends nearly two miles westerly from the island's northwest corner and has accumulated sufficient sand to form a broad sand spit with coastal strand habitats, including several native plants and the insects dependent upon them. Quarrying ceasing in 1938 when the island was sold to a hunting club, who in effect protected the habitat until 1968 when the East Bay Regional Park District acquired the land. The Brooks Island Regional Shoreline Preserve occupies 75 acres, including the main island, sand spit, and an offshore rock that serves as a shore bird rookery.

Despite a history of occupation by native people until the early 1800s and subsequent varied uses including goat ranching in the late 1800s, the rocky nature of Brooks Island has resisted takeover by Mediterranean grasses and other weeds that typically occurs in areas of deeper soils in coastal California, so a diverse flora persists, about 150 species of flowering plants, of which 92 are native species. Accordingly, there is a rich diversity of native Lepidoptera, whose caterpillars depend upon the native flora, mostly as specialists (Table 1). Of special interest are relict populations of species that presumably occurred on the adjacent East Bay mainland but no longer are found there. A surprising number of species, about 10% of the fauna, were either previously unknown in the San Francisco Bay region or East Bay area, or have not been recorded here for 50-100 years. It appears that Brooks Island has acted as a refugium for an appreciable number of insects during the region's dramatic increase in urbanization. No formally designated endangered species were discovered, but there are at least 20 species that are rarely encountered in the East Bay area (Table 2)..

Table 1. List of observed Lepidoptera

This compilation summarizes records of about 220 species of Lepidoptera (198-202 moths, 20 butterflies), members of 34 families, from Brooks Island. Observations were made by Y.-F. Hsu, M. McIntosh, and J. Powell during 19 daytime visits of 1.5 to 6.0 hours, in February, March, April, May, June, September, October, and November in 1993-97, including 13 nights light trapping in February-March and September-November. Larvae or larval mines were recorded for 66 species (31%), including 48% of the Microlepidoptera, adults only for the remainder.

About 167 of the species (80%) are native insects, using native plants as larval foods or are detritivores, and several of the remainder are native insects that depend upon host plants that certainly or probably are not native on the island (e.g., *Cupressus, Ceanothus)*. The diversity and abundance of native plants in the flora (ca 92 species), and the proportion new to the Lepidoptera inventory among species observed during 1996 (ca. 24% in March; 10% in September) suggest that additional moth species are to be expected, particularly in winter-early spring and in May-August when we did not make nocturnal samples. Thorough inventory would involve numerous visits in all seasons and would depend in part on more comprehensive nocturnal sampling by ultraviolet lights. Recognition of vagrant individuals from the mainland poses a problem to an inventory of flying insects found on Brooks Island, particularly those recorded only by light traps.

Abbreviations: **e**= exotic, **n**= native; **r**= resident, **v**= vagrant; **la**= larva or **mi** = larval mines, **II-XI**, months, February to November; **!** = unique record on Brooks I. Larval collections at Brooks Island designated by year-month-collection numbers (e.g., 93D7 = 7th collection in April, 1993); ***** = association with exotic or weedy larval host plant.

	1st record	last record	status
Moths:			
NEPTICULIDAE			
Stigmella heteromelis Newt. & Wilkinson 96C14.1 on Heteromeles arbutifolia	mi III.96**!**		n, r
Stigmella sp. 93D1.1 on Ceanothus arboreus	mi IV.93		n, r*
Stigmella sp. 94J9, 95K28, L9 on Salix laevigata & S. lasiolepis (serpentine mine)	mi IX.94	XI.95	n, r
Stigmella sp. 95K28.1 on S. lasiolepis (linear mine)	mi X.95		n, r
HELIOZELIDAE			
Coptodisca saliciella (Clemens) 94J9, 95F19, k28, L9 on Salix lasiolepis	mi IX.94	XI.95	n, r

TISCHERIIDAE			
Tischeria ceanothi Walsingham	mi IV.93	IX.96	n, r*
93D4 on Ceanothus arboreus			
Tischeria splendida Braun	III.94**!**		
TINEIDAE			
Monopis crocicapitella Clemens	IX.94	III.96	n, r
Tinea niveocapitella Chambers	IX.94	IX.96	r
Tinea occidentella Chambers	IX.94	IX.96	r
Tinea pallescentella Stainton	IX.95**!**		r
unplaced tineine	X.95 **!**		
GRACILLARIIDAE			
Caloptilia diversilobiella Opler?	IX.94	X.95	n, r
poison oak leaf roller			
Cremastobombycia sp.	mi X.94 **!**		n, r*
94K3 on Gnaphalium luteo-album			
Phyllonorycter sp.	mi IX.94	X.95	n, r
94J9, 95K28 on Salix laevigata			
Phyllonorycter sp.	mi IX.94 **!**		n, r
BUCCULATRICIDAE			
Bucculatrix transversata Braun?	VI.95 **!**		n, r
95F15 on Ambrosia psilostachya			
Bucculatrix variabilis Braun	IV.93	III.96	n, r
93D2, 96C25 on Baccharis pilularis			
DOUGLASIIDAE			
Tinagma californica Gaedike	IV.93	III.96	n, r
assoc. Phacelia californica			
OECOPHORIDAE			
Endrosis sarcitrella (L.)	IX.94		e, r
white-shouldered house moth			
Esperia sulphurella (F.)	IV.93 **!**		e, r
COSMOPTERIGIDAE			
Cosmopterix molybdina Hodges	IV.94 **!**		n, r
Walshia miscecolorella (Chambers)	IX.94	X.95	n, r
false indigo moth, sweetclover root borer			
MOMPHIDAE			
Mompha achlyogroma Koster & Harrison	IX.94 **!**		n, r

COLEOPHORIDAE			
Batrachedra striolata Zeller	XI.95		n, r
95L10 in Pontania galls on Salix			
Coleophora n. sp. near annulicola Braun	IV.93	II.97	n, r
93D7, 97B33 on Aster chilense			
Coleophora baccharella Landry ms	IV.93	IX.96	n, r
93D2, 94C95, 96C26 on Baccharis			
Coleophora tildeni Landry ms	IV.93	IX.96	n, r
93D2, 96C26 on Baccharis pilularis			
Coleophora sp.	IX.96 **!**		
Coleophora sp.	IX.94		n, r
94K2 in fl. heads Grindelia humilis			
Coleophora (whitish)	IX.94 **!**		
Coleophora sp.	III.96 **!**		n, r
96C26 on Sanicula			
BLASTOBASIDAE			
Hypatopa sp. near iceryaeella (Riley)	IV.93	IX.96	n, r*
93D1.2 in Ceanothus inflorescence			
94C100 in old seed pods Lupinus			
Hypatopa (gray, not iceryaeella-like)	X.95	IX.96	
Holcocera sp.	III.94		r
94C92 in cones Cupressus			
unplaced blastobasid (white FW)	IX.94 **!**		
GELECHIIDAE			
Aristotelia argentifera Busck	IV.93	IX.96	n, r
93D3, 94C94 on Baccharis pilularis			
Aroga trachycosma (Meyrick)	IV.94	VI.95	n, r
94D75 on Frankenia grandifolia			
Bryotropha hodgesi Rutten	IX.94		n, r
Chionodes dammersi (Keifer)	II.28.97		n, r
97B30 on Eriogonum latifolium			
Chionodes nanodella (Busck)	IX.94	IX.96	n, r
Chionodes sp.	XI.95 **!**		
Gnorimoschema baccharisella Busck	IX.94	IX.96	n, r
94K1 stem gall on Baccharis pilularis			
coyote brush gall moth			
Gnorimoschema saphirinella (Chambers)	VI.95	X.95	n, r
Gnorimoschema new sp.	X.95 **!**		
Leucogoniella californica (Keifer)	IX.94 **!**		n, r
Recurvaria bacchariella Keifer	IV.93	III.94	n, r
93D3, 94C94 on Baccharis pilularis			

Recurvaria ceanothiella Braun	IV.93	IX.96	n, r*
93D1, 96C16 on Ceanothus arboreus			
Scrobipalpula psilella complex	IX.94	III.96	n, r
Symmetrischema striatellum (Murtfeldt)	IV.93	III.96	n, r
93D8, 94C93, 95E27, F16, K29. L8, 96C32 tip tier on Solanum			
Telphusa sedulitella (Busck)	VI.94 **!**		n, v?
oak groundling			
Tuta sp.?	IV.93 **!**		
93D9 on Atriplex			
unplaced gelechiid	X.95 **!**		
EPERMENIIDAE			
Epermenia cicutaella Kearfott	XI.95 **!**		n, r?
SCHRECKENSTEINIIDAE			
Schreckensteinia festaliella (Hübner)	IV.94	II.97	n, r
assoc. Rubus vitifolius			
blackberry leaf skeletonizer			
PLUTELLIDAE			
Plutella xylostella (L.)	IX.94	X.95	e, r
diamondback moth			
LYONETIIDAE			
Bedellia somnulentella (Zeller)	IX,96	II.97	e, r
97B31 on Convolvulus			
morning glory leaf miner			
ARGYRESTHIIDAE			
Argyresthia cupressella Walsingham	III.94 **!**		n, r
Argyresthia pilatella Braun	III.96 **!**		n, r
Argyresthia trifasciae Braun	IV.93		n, r*
93D15.1 on Cupressus macrocarpa			
SESIIDAE			
Penstemonia clarkei Engelhardt	VI.95		
Synanthedon bibionipennis (Boisduval)	VI.95 **!**		
strawberry crown moth			
CHOREUTIDAE			
Tebenna gnaphaliella (Kearfott)	IV.93	X.95	n, r*
93D10, 94D71, D79 on Gnaphalium			

TORTRICIDAE			
Olethreutinae:			
Bactra verutana Zeller	X.95	IX.96	n, r
Endothenia conditana (Walsingham)	IV.93	III.94	n, r
Endothenia hebesana (Walker)	IX.94	V.95	n, r
verbena bud moth			
Epiblema strenuana (Walker) (beach race)	IV.93	VI.95	n, r
95F15 on Ambrosia psilostachya			
ragweed borer			
Epinotia columbia (Kearfott)	II.97		n, r
97B28 on Salix lasiolepis			
Epinotia cupressi Heinrich	IV.93		n, r*
93D15 on Cupressus macrocarpus			
Epinotia infuscana (Walsingham)	IV.93	II.97	n, r
93D12, 97B32 on Lupinus arboreus			
Epinotia kasloana (Kearfott)	IV.93	II.97	n, r
93D1.5, 96C16, 97B27 on Ceanothus			
Epinotia seorsa Heinrich	III.94 **!**		n, r
94C101 on Salix laevigata			
Eucosma suadana Heinrich	VI.95	IX.96	n, r
Notocelia culminana (Walsingham)	IX.94		n, r
Phaneta misturana (Heinrich)	III.94	II.97	n, r
Cydia americana (Walsingham)	IV.93	IV.94	n, r
Cydia cupressana Kearfott	IV.93	IV.94	n, r
assoc. Cupressus macrocarpus			
cypress cone moth			
Grapholita caeruleana Walsingham	IV.93	II.97	n, r
assoc. Lotus wrangellianus			
Grapholita lunatana Walsingham	IV.94	II.97	n, r
assoc. Lathyrus			
Tortricinae:			
Acleris hastiana (L.)	III.94	IX.96	n, r
94C101, 94D60 on Salix laevigata			
Acleris keiferi Powell	IV.93	VI.95	n, r
93D13 on Rosa californica,			
94D59 on Rubus vitifolius			
Acleris senescens Zeller	IV.93	III.96	n, r
93D5, 94C101, D60, 96C33, C15 on			
Salix laevigata and S. lasiolepis			
Acleris variegana (Schiffermüller)	IV.93	IX.96	e, r
93D13 on Rosa californica			
variegated button			

Croesia albicomana (Clemens)	IV.93	III.94	n, r
93D13, 94C99 on Rosa californica			
Anopina triangulana (Kearfott)	IX.94	IX.96	n, r
Cnephasia longana (Haworth)	IV.93	VI.95	e, r
93D4 on Achillea millefolium			
94D66 on Centauria melitensis			
94D70 on Wyethia angustifolia			
omnivorous leaf-tier			
Argyrotaenia franciscana (Walsingham) complex	IV.93	II.97	n, r
94C101 on Salix laevigata			
94D77 on Artemisia douglasiana			
94D78, 97B18 on Scrophularia californica			
94J6 on Grindelia humilis			
96C25 on Baccharis pilularis			
97B16 on Gnaphalium			
apple skinworm			
Clepsis peritana (Clemens)	X.95 **!**		n, r
garden tortrix			
Amorbia cuneana (Walsingham)	III.96	IX.96	n, r
96C14 on Heteromeles arbutifolia			
Platynota stultana (Walsingham)	IV.93	II.97	e, r
94J11 on Spergularia macrotheca			
94J6 on Grindelia humilis			
94J7 on Grindelia hirsutula			
97B24 on Atriplex patula			
omnivorous leaf roller			
Aethes sp. (near smeathmanniana?)	III.96 **!**		n
Henricus macrocarpanus (Kearfott)	III.94 **!**		n, r
94C92 in cone Cupressus macrocarpus			
Saphenista latipunctana (Walsingham)	IV.93	IX.96	n, r
assoc. Eriophyllum			
Saphenista nomonana (Kearfott)	IV.93	III.96	n, r*
93D1, 96C16 on Ceanothus arboreus			
Saphenista saxicolana (Walsingham)	III.94	IX.94	
94C94, J5 on Baccharis pilularis			
PTEROPHORIDAE			
Amblyptilia pica (Walsingham)	IV.94 **!**		n, r
94D82 on Scrophularia californica			
Oidaematophorus confusus Braun	IV.94	III.96	n, r
94D65, 96C28 on Baccharis pilularis			
Oidaematophorus grandis (Fish)	IX.94	IX.96	n, r
Oidaematophorus meyricki Barnes & Lindsey	IX.94 **!**		
Oidaematophorus sp.	IX.95		n

Platyptilia carduidactyla (Riley)	IV.93		n, r
93D6 in flower Cirsium			
artichoke plume moth			
Platyptilia pallidactyla (Haworth)	IV.93	IV.94	e, r
Platyptilia williamsi Grinnell	IV.94	II.97	n, r
94D71, D79, 95F17 inflorescence Gnaphalium			
95F15 inflorescence Ambrosia psilostachya			
97B16 inflorescence Anaphalis?			
97B24 inflorescence Atriplex patula			
Platyptilia not williamsi?	X.95		n
CRAMBIDAE			
Pyraustinae			
Achyra occidentalis (Packard)	IX.97 **!**		
garden webworm			
Agriphila anceps (Grote)	X.94	X.95	n, r
Agriphila undata (Grote)	IX.94	IX.96	n, r
Crambus occidentalis Grote	X.95		n, r
Diastictis fracturalis (Zeller)	IX.94 **!**		n
Dicymolomia metalliferalis (Packard)	IX.94	IX.96	n, r
Eudonia rectilinea (Zeller)	V.95	VI.95	n, r
Hellula rogatalis (Hulst)	IX.94	IX.94	e, r
cabbage webworm			
Lineodes integra (Zeller)	X.95	III.96	n, r
96C33 in Solanum ?furcatum			
Microtheoris ophionalis (Walker)	IX.94		n, r
Nomophila nearctica Munroe	X.95 **!**		n
North American grass webworm			
Pyrausta subsequalis (Guenee)	IX.94	IX.96	n, r
weedfield sable			
Tehama bonifatella (Hulst)	VI.95 **!**		n
Udea profundalis (Packard)	IV.93	X.96	n, r*
false greenhouse leaf-tier			
Uresiphita reversalis (Guenee)	IX.94	IX.96	e, r
96J4 on Lupinus arboreus			
genista caterpillar			
PYRALIDAE			
Ephestiodes gilvescentella Ragonot	IX.94	II.97	n, r
Homoeosoma electellum (Hulst)	IX.96		n, r
sunflower moth			
Lipographis fenestrella (Packard)	IX.94	IX.96	n, r
Patagonia peregrinum (Heinrich)	IX.94	IX.96	n, r
Phycitodes mucidellum (Ragonot)	IV.94	X.95	n, r
94K2 inflorescence Grindelia stricta			

Vitula edmansii (Packard) **dried fruit moth, honeycomb moth**	IX.94	IX.96	n, r
GEOMETRIDAE			
Dichorda illustraria (Hulst)	IX.94	IX.96	n, r
Drepanulatrix monicaria (Guenee)	IX.94 **!**		n
Elpiste marcescaria (Guenee) 94D62 on Baccharis pilularis	IV.94	IX.96	n, r
Epirrhoe plebeculata (Guenee)	II.97		n, r
Eupithecia acutipennis (Hulst) 96C17 on Artemisia californica	XI.95	III.96	n, r
Eupithecia annulata (Hulst)	II.97		n
Eupithecia miserulata zela Swett & Cassino 94C96 on Achillea millefolium	III.94	X.95	n, r
Eupithecia misturata (Hulst)	IX.94	IX.96	n, r
Eupithecia rotundopuncta Packard	III.96	III.96	n, r
Eupithecia subapicata Guenee	II.97		n, r
Neoalcis californiata (Packard)	X.95 **!**		n
Neoterpes edwardsata (Packard) 97B23 on Eschscholzia californica	X.95	II.97	n, r
Perizoma custodiata (Guenee)	IV.93	IX.96	n, r
Pero macdunnoughi Rindge **McDunnough's leafwing**	IX.94	II.97	n, r
Prochoerodes forficaria (Guenee)	IX.96 **!**		n
Synaxis truxaliata (Guenee)	X.95	IX.96	n, r
Sabulodes aegrotata (Guenee) **omnivorous looper**	IX.94	IX.96	n, r
Semiothis californiata (Packard)	X.95 **!**		n
Xanthorhoe defensaria (Guenee)	V,95	II.97	n, r
unplaced geometrid **la** 94C96 on Achillea	III.94 **!**		n
unplaced geometrid **la** 94C64 on Baccharis	III.94 **!**		n
SPHINGIDAE			
Smerinthus cerisyi Kirby 94C61, J8 on Salix lasiolepis **eyed sphinx**	IV.94	IX.94	n, r
ARCTIIDAE			
Apantesis proxima (Guerin-Meneville) **Mexican tiger moth**	IX.94	IX.96	n, r

NOCTUIDAE

Abagrotis sp.	IX.94		n,
Adelphagrotis stellaris (Grote)	IX.94	IX.96	n, r
Agrotis ipsilon (Hufnagel)	IX.94	IX.96	n, r
greasy cutworm, black cutworm			
Apamea cinefacta (Grote)	III.96		n,
Autographa californica (Speyer)	V.95	II.97	n, r
alfalfa looper			
Benjaminiola colorada (Smith)	IX.94		n, r
Caenurgina erechtea (Cramer)	IV.93	IX.96	n, r
forage looper			
C. togataria (Walker)	IX.94	IX.96	n, r
Cerastis robertsoni Crabo	III.96	II.97	n, r
Cryphia oaklandiae (Barnes & McDunnough)	IX.94 **!**		n
Dargida procincta (Grote)	IX.94		n
olive green cutworm			
Discestra chartaria (Grote)	IX.94	III.96	n, r
Egira curialis (Grote)	III.96 **!**		n
Egira perlubens (Grote)	III.96		n
Egira rubrica (Harvey)	III.96		n
Euxoa sp. (messoria?)	IX.94	IX.94	n, r
Euxoa obeliscoides (Guenee)	IX.94	IX.96	n, r
Euxoa olivia (Morrison)	IX.96 **!**		n
Euxoa punctigera (Walker)	IX.94 **!**		n
Euxoa septentrionalis (Walker)	IX.94	IX.96	n, r
Euxoa wilsoni (Grote)	X.95	IX.96	n, r
Feltia jaculifera (Guenee)	IX.94 **!**		e, v
dingy cutworm			
Heliothis phloxiphagus Grote & Robinson	IV.94	IX.96	n
Heliothis zea Boddie	IX.94	IX.96	n, r
corn earworm, bollworm, tomato fruitworm			
Hemieuxoa rudens (Harvey)	X.95	II.97	n, r
Homorthodes communis (Dyar)	IX.94	IX.96	n, r
Homorthodes fractura (Smith)	IX.96		n
Lacinipolia cinnabarina (Grote)	IX.94	IX.96	n
Lacinipolia patalis (Grote)	III.96 **!**		n, r
Lacinipolia pensilis (Grote)	IX.94	IX.96	n, r
Lacinipolia quadrilineata (Grote)	IX.94	IX.96	n, r
Lacinipolia strigicollis Wallengren	IX.94	IX.96	n, r
Lasionycta ochracea Riley	X.95		n, r
Leucania oregona Smith	IX.94	IX.96	n, r
Orthosia hibisci (Guenee)	III.96	II.97	n, r
speckled green fruitworm			
Orthosia praeses (Grote)	X.95	II.97	n, r

Papaipema sauzalitae (Grote)	III.94 la	II.97	n,cr
94C98, D78 stems Scrophularia californica			
97B24 stems Atriplex patula?			
Parabagrotis formalis (Grote)	IX.94	IX.96	n, r
Peridroma saucia (Hübner)	X.95	II.97	n, r
variegated cutworm			
Platyperigea extima (Walker)	IX.94	X.95	n, r
Protorthodes alfkeni (Grote)	IX.94	IX.96	n, r
Protorthodes rufula (Grote)	IX.94	IX.96	n, r
Pseudaletia unipuncta (Haworth)	IX.94	II.97	e, r
armyworm			
Pseudobryomima muscosa (Hampson)	IX.94		n, r
Pseudorthosia variabilis Grote	IX.94 **!**		n
Spodoptera exigua (Hübner)	IX.94	IX.96	n, r
beet armyworm			
Trichoclea edwardsii Smith	IX.94	III.96	n, r
Tricholita fistula Harvey	IX.94	III.96	n, r
Trichoplusia ni (Hübner)	II.97 **!**		e, v
cabbage looper			
Xestia adela Franclemont	XI.95	IX.96	n
Zosteropoda hirtipes Grote	IX.94	IX.96	n, r

Butterflies:

HESPERIIDAE

Pyrgus communis (Grote)	IV.93	X.95	n, r*
western checkered skipper			
Hesperia columbia (Scudder)	IV.94 **!**		n, v?
Columbian skipper			
Paratrytone melane (Edwards)	IX.96 **!**		n, r?
umber skipper			
Polites sabuleti (Boisduval)	IV.94	IX.96	n, r
sandhill skipper			

PAPILIONIDAE

Battus philenor (L.)	IV.93	II.97	n, r
larvae seen on Aristolochia			
pipevine swallowtail			
Papilion zelicaon Lucas	IV.93	II.97	n, r*
anise swallowtail			

PIERIDAE			
Anthocharis sara Lucas	III.94	IV.94	n, r?
sara orange tip			
Colias eurytheme Boisduval	X.94	IX.96	n, rv
probably not a continuous resident			
orange sulphur, alfalfa butterfly			
Euchloe ausonides (Lucas)	IV.93	III.96	n, r*
95E23 on Brassica			
large marble			
Pieris rapae (L.)	III.94	II.97	n, r*
cabbage butterfly			
LYCAENIDAE			
Brephidium exile (Boisduval)	X.95	XI.95	n, rv*
assoc. Atriplex hastata;			
probably not a continuous resident			
pigmy blue			
Celastrina ladon (Cramer)	III.94?	VI.95	n, r
spring azure			
Plebeius acmon (Westwood & Hewitson)	IX.96 **!**		n, r?
acmon blue			
NYMPHALIDAE			
Junonia coenia (Hübner)	IV.94	IX.96	n, r*
buckeye butterfly			
Phyciodes campestris (Behr)	IV.93	IX.96	n, r
field crescent			
Vanessa annabella (Field)	III.94	II.97	n, r
94C1, D68 on Sidalcea malvaeflora			
west coast lady			
Vanessa cardui (L.)	V.95	III.96	n, v*
painted lady			
Vanessa virginiensis	IV.94	II.97	n, r
94D69, D79, 95F17 on Gnaphalium			
97B17 on Anaphalis?			
American lady, Virginia lady			
Danaus plexippus (L.)	X.95	IX.96	n, v
monarch butterfly			
SATYRIDAE			
Coenonympha california Westwood	IV.93	IX.96	n, r
California ringlet			

Table 2. Rare and unusual species

1. *Coleophora* species near *annulicola* Braun (Coleophoridae)

We reared this tiny moth from case-bearing larvae found on *Aster*. We discovered this species at the Richmond Field Station in 1992, and its occurrence on Brooks Island helps explain its persistence in a weedy, disturbed site on the adjacent shoreline. J.-F. Landry, Biosystematics Research Institute, Ottawa, Canada, believes the species is undescribed.

2. *Aroga trachycosma* (Meyrick) (Gelechiidae)

This species feeds on Alkali Heath, *Frankenia*, and was recorded only in Santa Clara County in the Bay region previously. This plant evidently colonized the sand spit some time after the breakwater was constructed, having been first recorded by Bacigalupi and Heckard in 1965.

3. *Chionodes nanodella (*Busck) (Gelechiidae)

This species, a general feeder on low herbs, has been recorded on the San Francisco Peninsula but not previously in the East Bay.

4. *Tinagma californicum* Gaedike (Douglasiidae)

This tiny, diurnal moth is known from various parts of northern California. It was recorded in the East Bay only in the Berkeley Hills in El Cerrito, in 1962, at a habitat subsequently destroyed by road construction. The larvae are believed to be stem or seed miners on *Phacelia californica*.

5. *Epermenia cicutaella* Kearfott (Epermeniidae)

This species is widespread in North America and was reported from Mills College in 1923, but it has not been recovered in the East Bay area since that time. A single, fresh-appearing specimen was taken in October. The larvae of related species feed on umbells, so *Sanicula* or *Lomatium* are possible host plants on Brooks Island.

6. *Endothenia conditana* (Walsingham) (Tortricidae)

This diurnal moth was described originally from Mendocino County and is known in the East Bay Counties only from a specimen taken in the Berkeley Hills in 1962 at a site above Oakland that has been urbanized subsequently. The larvae feed on *Stachys*.

7. *Epinotia infuscana* (Walsingham) (Tortricidae)

We found larvae of this species in stems of *Lupinus arboreus*. The moth is distributed widely along the immediate coast, but it was not known from the East Bay until we discovered it at the Richmond Field Station in 1992, on *Lupinus* thought to have been planted along the abandoned railroad bed.

8. *Notocelia culminana* (Walsingham) (Tortricidae)

This species was collected at Pleasant Hill in 1960 and Orinda in 1969 but has not been recorded in coastal East Bay areas. The larvae feed on *Rosa.*

9. *Phaneta misturana* (Heinrich) (Tortricidae)

This moth is known from inland stations and San Mateo County southward in coastal California. The adults were abundant on Brooks Island, closely associated with *Artemisia californica*, in March 1996. This is the first record in the East Bay counties.

10. *Acleris keiferi* Powell (Tortricidae)

I described this species 40 years ago, based on specimens collected in the 1920's in San Francisco, and from Berkeley in 1931. No population had been known in the East Bay since that time. We found larvae on *Rosa californica*, a new host plant record, and *Rubus*; it has been reared elsewhere from other Rosaceae, blackberry and strawberry.

11. *Apantesis proxima* (Guer.-Meneville) (Arctiidae)

Perhaps the most surprising discovery was the Mexican Tiger Moth, which has a colony on the island, as several males were taken in light traps in Sept.-Oct., 1994-96 and one in March 1996. *A. proxima* is a colorful species that is liable to be collected by any lepidopterist or entomology student. It is widely distributed to the south and inland, from Monterey and Stanislaus Counties southward; but it was not known to be established in the San Francisco Bay region.

12. *Abagrotis erratica* (Smith) (Noctuidae)

This distinctive noctuid has pink forewings. It was taken several times at Walnut Creek during a 12-year light trap survey, but it has not been recorded in the immediate Bay area.

13. *Adelphagrotis stellaris* (Grote) (Noctuidae)

This species is known from coastal parts of California south to Monterey County but not in the East Bay region previously.

14. *Euxoa obeliscoides* (Guenee) (Noctuidae)

This distinctively patterned noctuid flies in late summer and fall and is widely distributed in western North America. It occurs inland in California and has not been recorded in coastal parts of the San Francisco Bay region.

15. *Euxoa wilsoni* (Grote) (Noctuidae)

Larvae of this large noctuid live in active coastal sand dunes. The species was numerous in San Francisco prior to the turn of the century, when the western area was active sand dunes. In recent decades it has been recorded at Pt. Reyes, but there were no known populations in the East Bay area. One specimen was taken at Brooks Island in Oct. 1995, one in Sept. 1996.

16. *Homorthodes hanhami* (Barnes & McDunnough) (Noctuidae)

Several specimens of this noctuid were taken in light traps, indicating a resident population. I have not seen other records of *H. hanhami* in the San Francisco Bay region.

17. *Lasionycta ochracea* (Riley) (Noctuidae)

This is another coastal sand dune dweller; the highly modified larvae are legless. It was numerous at Alameda in the 1880s and occurred at San Francisco at least until the 1920s prior to destruction of the sand dunes. Larvae were common at Pt. Reyes in the 1970s. Two specimens were taken in a light trap at Brooks Island in Oct. 1995, the first East Bay record in more than a century.

18. *Papaipema sauzalitae* (Grote) (Noctuidae)

Larvae of *P. sauzalitae* are stem borers in various herbs. The species was originally described from Marin County, as the name indicates, but evidently it has become increasingly rare in recent decades. It was recorded in San Francisco in the early 1900's and at Hayward in 1971, but not in the East Bay area since that time. On Brooks Island larvae were abundant in stems of *Scrophularia californica* in the spring, and the adults were numerous in September.

19. *Trichoclea edwardsii* Smith (Noctuidae)

One specimen of this species was taken at Albany in 1957, but otherwise it has not been known in the East Bay area. Several adults were attracted to blacklight at Brooks Island in September, indicating a resident population.

20. *Hesperia columbia* (Scudder) (Hesperiidae)

The Columbia Skipper butterfly occurs at Mt. Diablo and was recorded at Piedmont in 1937 and southward in the Oakland Hills, but not in recent decades. One male was taken at Brooks Island, probably representing a resident colony, as *H. columbia* is not known to commonly wander as a vagrant.