Critique of Otay Mesa SRP EIR

CEQA compliance

0-7-1 Section 4.1.2.1 ostensibly discusses alternative project sites capable of achieving the project goals. Unfortunately, this section of the EIR does not identify any specific alternative location(s) and contains no specific discussion of impacts associated with alternative project locations. Instead, this section dismissively concludes that any such locations would likely have the same sort of environmental impacts. This does not meet the CEQA requirement to provide sufficient specific information to permit a reviewer to objectively assess the impacts associated with specific alternative locations and to compare those impacts with those identified for the proposed preferred project location. The key here is that CEQA requires that an EIR identify environmental impacts of a project and those of a range of reasonable alternatives. Absent such information, no objective comparison is possible and the EIR needs to be amended and resubmitted for public review to correct this deficiency.

0-7-2 Just as the environmental impacts of the various onsite alternatives are similar, but vary in specific impacts to resident biological resources, so would alternative project locations have their own unique suites of environmental impacts. Furthermore, there is no indication that the project objectives could not be achieved, substantially or entirely, by considering an alternative project location removed from the biologically sensitive Otay Mesa area. Here it is notable that CEQA requires consideration of project alternatives unconstrained by cost considerations. The goal is to identify an environmentally superior project alternative. In this instance, because impacts to sensitive biological resources are scattered throughout the project site, the best alternative may be that which has the smallest footprint (Alternative G), an unidentified alternative location, or no project at all.

0-7-3 As noted in other sections of the EIR, a range of onsite alternative designs with different mixes of housing and other land uses, each having different configurations and associated impacts, have been identified (Alternatives A, C-G). The varying degrees of environmental impacts associated with each alternative are ultimately related to the topography and distribution of biological resources scattered over the entire project site, as well as the proximity of conserved habitat to anticipated incompatible urban land uses.

0-7-4 As discussed below, the “preferred” project identified in the EIR would probably be the “kiss of death” for the resident Quino Checkerspot Butterfly (QCB) population. All proposed development alternatives are likely to result in QCB population decline and possible extirpation. The speed of population decline would likely be in direct proportion to the degree of interaction of the adjacent human population (see discussion below). In

0-7-4 Cont.

that regard, QCB population decline might be expected to decline slowest if the least amount of land adjacent to occupied QCB habitat were converted to urban uses, as in Alternative G; however, the best outcome for QCB, would be to avoid all human occupation of adjacent lands.

Impacts to Quino Checkerspot Butterfly (QCB)

[Biological resources] Fig. 2.3.-3 (Sensitive wildlife species map),

2.3-10 (Sensitive wildlife species map with proposed development footprint)

2.3.11 (QCB & host plants)

0-7-5

Figs. 2.3-3, 2.3.10, and 2.3-11 in the DEIR Biological Resources Section of the DEIR depict locations within the project area where QCB adults have been sighted, where two of its host plants, owls clover (*Castilleja exserta*) and dot seed plantain (*Plantago erecta*) were found, and where the proposed development footprint overlaps those sites. There is no indication of the distributions of other potential host plants, such as snapdragon (*Antirrhinum*), Chinese lanterns (*Collinsia*), and rigid bird's beak (*Cordylanthus*), which are important oviposition sites and larval food plants in some regions of southern California (Pratt *et al* 2001 and Pratt & Pierce 2010). Nor are there indications where other resources, such as nectar sources and shrub cover (for diapause larvae) in proximity to larval hosts, are distributed. At the time of its listing as Endangered, only two QCB larval host plant species were recognized (*C. exserta* and *P. erecta*), while others have been confirmed in the course of subsequent field surveys (Pratt, *et al* 2001; Pratt & Pierce 2010). Current USFWS survey guidelines for QCB (Dec. 2014) require mapping of six larval host plant species: *Antirrhinum coulterianum, Castilleja exserta, Collinsia heterophyllum, Cordylanthus rigidus, Plantago Erecta, P. patagonica*, and "other potential larval host plants". It is also notable that QCB larvae in lab colonies readily feed on *Antirrhinum nuttallianum*, and prefer *Collinsia concolor* over *Plantago erecta* (Pratt, personal observations). All field observations of QCB larvae using *Collinsia* refer to *C. concolor.* It is notable that, although not discussed in the DEIR, an earlier plant survey of Otay ranch (RECON 1989) included *A. nuttallianum*, but apparently overlooked *P. erecta* and *C. exserta*. Current QCB survey guidelines also require mapping of all observations of QCB larvae and nectar sources; but that information is also absent from the DEIR discussion of the various project alternatives (perhaps such observations were not recorded). The failure of the DEIR to identify the presence and distribution of all potential QCB larval host plants and adult nectar sources within the project area limits the utility of that document for the purpose of comparing project alternatives with respect to potential direct impacts to the QCB population. These issues are discussed further below.

0-7-6

Although the DEIR states that impacts to QCB can be mitigated to a level of “less than cumulatively considerable*”, no convincing evidence of that determination is presented. While the DEIR indicates that four of five projects proposed for the same general area of SW San Diego County are believed to harbor QCB and are likely to be required to provide mitigation for impacts to that species, no specific impacts or mitigations related to those projects have been identified. Absent such information, it is not reasonable to conclude (as the DEIR does) that impacts to QCB can be mitigated to a level of “less than cumulatively considerable”.

0-7-7

Perhaps more to the point, the DEIR does not present convincing evidence that any of the project alternatives would not lead to decline or extirpation of QCB within the project boundary (or regionally), regardless of putative cumulative impacts. The implicit assumption in the EIR is that the 966 acres to be conserved (2/3 of “critical habitat” within the project area), including four acres of restored habitat, constitute 2/3 of “suitable habitat” for QCB on site and is, therefore, sufficient to maintain the resident QCB population. But that does not necessarily equate to preserving 2/3 of the QCB population and its essential resources; nor is there any assurance that such a degree of habitat preservation would be sufficient. Such an assertion might be valid if all critical resources for QCB were evenly distributed and if their value to the QCB population did not also have a geographic component. However, the distribution maps for QCB adult sightings and larval host plants (Figs. 2.3-10 and 2.3-11) indicate their clumped, rather than evenly distributed, occurrences.

0-7-8

The EIR does not adequately evaluate the viability of the resident QCB colony with respect to the “edge effect” of future planned (and/or likely) adjacent land uses associated with the various project development alternatives. The project alternatives portray an array of alternative development footprints which seek to preserve some concentrations of QCB sightings and host plants, at the expense of losing others. However, in addition to variable direct loss of QCB habitat, all alternative development alternatives would increase the degree of exposure of the resident QCB population to potentially (or likely) incompatible anthropogenic land uses, including residential neighborhoods. This is most easily seen by comparing the convoluted lineal perimeters of the various alternatives; the greater the perimeter, the greater the exposure of the QCB population to “edge effect” impacts likely to cause QCB population decline. Here it should be noted that proximity to human populations is strongly correlated with prior QCB extinction events in Southern California (Preston, *et al*, 2012). Although the specific cause(s) of previous extinctions may vary with location, they likely include loss of habitat values, such as nectar sources (Minnich 2008), larval hosts, and shrub cover due to direct conversion of habitat to “developed” uses, invasion by exotic species, trampling of larvae by livestock, humans and domestic (or feral) pets, increased fire frequency, and recreational activities (Preston, *et al* 2012).

0-7-9 The past history of the decline and extirpation of QCB colonies in Southern California parallels human population growth and the spread of urbanization (Preston, *et al*, 2012). For example, a colony of QCB persisted on nearby Dictionary Hill in San Diego until it became surrounded by urban neighborhoods in the 1970s. Although the upper slopes of Dictionary Hill still maintain populations of QCB larval host plants, the butterfly no longer exists there. Likewise, QCB populations in Orange County, the Gavilan Hills and along Warm Springs Creek in Murrieta (both in Riverside county) have disappeared, although larval host plant populations persist there. What these and all other extirpated QCB population sites have in common is nearby human population growth and urban encroachment.

0-7-10 Inadvertent mortality of QCB larvae from trampling by recreationists is certainly a contributing factor in the decline of some QCB colonies. Numerous dead QCB larvae, apparently trampled by ORVs, foot, and equestrian traffic, were found along informal recreation trails within and adjacent to QCB colonies at Harford Springs County Park and the Warms Springs Creek QCB Preserve in Murrieta (Riverside County), shortly before those QCB colonies were extirpated (Ballmer & Pratt, personal observations). Because post-diapause QCB larvae spend much time on or near the soil surface to absorb solar energy and feed on low plants, they often occur on and adjacent to the bare soil of recreation and game trails, where they and their host plants are especially vulnerable to trampling by grazing animals and human traffic.

Some pertinent aspects of QCB biology/ecology

0-7-11 The old adage which cautions against ‘putting all one’s eggs in one basket’ aptly describes QCB behavior. Adult QCB usually appear in late winter and early spring, but actual timing depends on variable weather patterns, which also affect the appearance, growth, and longevity of nectar sources and larval host plants. Mated females disperse to deposit eggs on suitable host plants which may be widely dispersed and located some distance away from the site of mating. Availability of appropriate nectar sources may prolong the longevity and increase the fecundity of female QCB. While adult male QCB use a wide variety of nectar sources, females use a narrower suite of nectar sources (*e.g. Chaenactis glabriuscula, Layia glandulosa,* and *Senecio californicus*) (Pratt, personal observations).

Mated females deposit clusters of eggs near the ground on larval host plants; young larvae feed for 2-4 weeks depending upon temperature and food plant quality and then disperse to find secluded sites where they remain dormant (diapause) for several months (or even years). Larvae break diapause with the onset of winter rains, when they leave their secluded diapause shelters and actively seek out and feed on young sprouts of their host plants (Osborne & Redak 2000). One factor that helps QCB colonies to persist through periodic drought is the proclivity of larvae to remain in

diapause for multiple years (Pratt & Emmel, 2010). Even under ideal conditions for growth, a substantial percentage of post-diapause QCB larvae in lab colonies typically re-enter diapause for another year or more (*ibid*).

Dispersal of mated females can account for the historical distribution of QCB in widely scattered locations, and helps to ensure population viability by maintaining a distributed metapopulation structure and re-establishment of colonies at sites where QCB had previously died out. Metapopulations of QCB are characterized by subpopulations having different mixes of reproductive resources (larval host plants, shrub cover, and topographic features), which buffer the population against environmental stochasm (wild fires, drought, poor timing of rainfall, etc). While stochastic events may cause some subpopulations to decline during a given season, others may prosper.

O-7-11 Cont.

In general, QCB reproductive success depends on presence of suitable host plants throughout the extended period from post-diapause larval emergence (late fall and winter), through adult maturation and oviposition (late winter and spring), and pre-diapause larval development (early to mid spring). Because larval host plants are mostly short-lived annuals whose longevity depends on fickle rainfall patterns, pre- and post-diapause larvae may feed on different plant species. Host plants used by post-diapause QCB larvae appear sooner and grow more quickly on exposed, south-facing slopes, but pre-diapause larvae use hosts which may appear later and persist longer on north-facing slopes and in the shade of shrubs.

Female QCB prefer to oviposit on plants in sunny locations, but as those plants senesce or become defoliated, young larvae may seek out more succulent host plants in partially shaded situations, such as those growing among shrubs. Shrub cover in proximity to larval food plants is also important in providing suitably sheltered sites for diapause larvae (Pratt & Emmel, 2010). While large expanses of larval host plants, as may occur in meadows, may maximize the production of larvae, the absence of shrub cover for diapause larvae maximizes their mortality (*ibid*). Thus, a mosaic of shrub cover and open sunny patches of larval host plants, along with topographic diversity, promote survival of QCB and should be critical components of a QCB habitat preserve. Another *sine qua non* is absence of substantial human population adjacent to the QCB habitat.

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NOTES

^*CEQA Guidelines 15130: Cumulative Projects Description August 2011 3-1 ConocoPhillips Santa Maria Refinery Throughput Increase DEIR 3.0 Cumulative Projects Description Section 15130 of the California Environmental Quality Act (CEQA) Guidelines requires that an Environmental Impact Report (EIR) discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable,

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as defined in Section 15065(c). Section 15355 of the State CEQA Guidelines defines "cumulative impacts" as two or more individual effects that, when considered together, are either considerable or compound other environmental impacts. State CEQA Guidelines (14 CCR 15130) require a reasonable analysis of the significant cumulative impacts of a Proposed Project. Cumulative impacts are defined by CEQA as "two or

more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts" (State CEQA Guidelines, Section 15355).

Cumulative impacts are further described as follows:
The individual effects may be changes resulting from a single project or a number of separate projects. The cumulative impacts from several projects are the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time (State CEQA Guidelines, Section 15355[b]). Furthermore, according to State CEQA Guidelines Section 15130(a)(1): As defined in Section 15355, a "cumulative impact" consists of an impact that is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts. An EIR should not discuss impacts which do not result in part from the project evaluated in the EIR.
In addition, as stated in the State CEQA Guidelines, Section 15064(i)(5): The mere existence of significant cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed project's incremental effects are cumulatively considerable. A typical "project specific" cumulative analysis looks at the changes in the environment that result from the incremental impact of development of a Proposed Project and other reasonably foreseeable projects that have not been included in the environmental setting. For example, the air quality impacts of two projects in close proximity may prove to be insignificant when project emissions are analyzed separately, but could be significant when these emissions are combined and analyzed together. While these projects may be unrelated, their combined (*i.e.,* cumulative) air quality impacts would be significant.

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Cont.

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Born 21 August 1945, Toledo, Ohio, USA
Higher Education:
Bachelor of Science in Entomology 1967 - UC Riverside
Master of Science in Entomology 1973 - UC Riverside

Professional:
November 1967 - November 1970: US Peace Corps Volunteer/Entomologist in Thailand National Malaria Eradication Project
Sept. 1971-Sept. 1973 Research Assistant, Entomology Department, University of California, Riverside
May 1974 to June 2008: Staff Research Associate in Entomology Department, University of California, Riverside

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Recent professional work
Experience in conducting research on economic control of insect pests of cotton, lettuce, tomato, pepper, strawberry, citrus, and grapes. Insect subjects of research include pink bollworm (*Pectinophora gossypiella*), cotton budworm (*Heliothis virescens*), tomato fruitworm (*Heliothis zea*), beet armyworm (*Spodoptera exigua*), cabbage looper (*Trichoplusia ni*), silverleaf whitefly (*Bemisia argentifolii*), greenhouse whitefly (*Trialeurodes vaporariorum*), glassywing sharpshooter (*Homalodisca vitripennis*) , and pepper psyllid (*Paratrioza cockerelli*).

Other professional and personal pursuits include research on systematics, ecology, and larval morphology of lycaenid butterflies (Lepidoptera), systematics of *Apiocera* and *Rhaphiomidas* (Diptera), and insect conservation.

Avocational interests include participation in resource conservation-oriented organizations: Tri-County Conservation League (current President and member of Board of Directors), Riverside Land Conservancy (past Secretary and current member of Board of Directors), insect photography, travel (especially Southeast Asia).

Other accomplishments:
Wrote petition to list Delhi Sands Giant Flower-loving Fly as Federal Endangered Species (1989); listed 1993. Co-wrote petition to list the Valley Giant Flower-loving Fly as Federal Endangered Species (2014).

Award for outstanding service to USDA as member of Cuckoo Bee Task Force, 1993

Presenter at South Coast Missing Linkages Workshop, University of Redlands, 7 August 2002: “The Role of Arthropods in Habitat Linkages”.
Presenter at various professional seminars on agricultural and other entomological research.

Co-instructor (with David Hawks, Ken Osborne, and Gordon Pratt) for workshop on biology and ecology of the Endangered Quino Checkerspot Butterfly (*Euphydryas editha quino*) for professional surveyors and public trust agency biologists, December 1998 and January 1999, Riverside, CA.

Travel: Australia 1986, Brazil, Burma, Cambodia, England, Indonesia, Japan, Lao PDR, Malaysia, Mexico, Sweden, Thailand 1967-'71 (continuously) and 1986-2015 (1-2 months/year).

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3. Bi, J. L., G. R. Ballmer, N. C. Toscano, and M. A. Madore. 2000. Effect of nitrogen fertility on cotton-whitefly interactions, pp. 1135-1142. *In*: Proc. Belt-wide Cotton Conferences, 2000, National Cotton Council.
4. Bi, Jian-long, G.R. Ballmer and N.C. Toscano. 2004. Evaluation of Novel Insecticides Against the Greenhouse Whitefly on Strawberries. *In:* Proceedings of the 15th International Plant Protection Congress, Beijing, China, May 11-16, p. 169.

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Curriculum Vitae Gordon Pratt

NAME: Gordon F. Pratt

PLACE AND YEAR OF BIRTH: Toronto, Ontario, May 9 1953

CITIZENSHIP: Became a Naturalized Citizen of the United States on October 30, 1992 at Philadelphia, Pennsylvania: Naturalization No. A08 583 460.

EDUCATION: Northeastern University, 1971-1976, Boston, Mass., Bachelors Science in Biology with Honors.

Queen's University, 1976-1979, Kingston, Ont., Masters in Molecular Biology, Oct., 1979.

University of California, Riverside, Fall 1980 - Fall 1988, PhD. in Entomology (Insect Systematics), with an inside minor in insect/plant interactions and an outside minor in Population Biology.

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HONORARY SOCIETIES: The Academy
Phi Sigma

AWARDS: Outstanding Teaching Assistant for Entomology at UCR in 1984 (for Insect Systematics).

John Adams Comstock Award that is given for outstanding student presentation at the June 1985 Lepidopterist Society Meetings of the Pacific Slope Branch in the San Bernardino Mts.

MEMBERSHIP IN PROFESSIONAL SOCIETIES

Lepidopterists' Research Society
Friends of the Entomology Research Museum
Lepidopterists' Society
Entomological Society of Washington
Pacific Coast Entomological Society
High Country Garden Club

Previous Field Work on the Military Bases of Southern California that Relates to the Potential Contract

I have been studying and identifying insects in the Mojave Desert since the early 1980s. From 1994 to 1996 I studied the butterflies on three of the Mojave Desert Military Bases: China Lake Naval Air Weapons Station (CLNAWS), Fort Irwin National Training Center (FINTC), and Edwards Air Force Base (EAFB) (Pratt 1999a). From 1996-1998 I did an Invertebrate Survey of EAFB (Pratt 1998, 1999b, 2000). From 2001 to 2005 I did an Invertebrate Survey of Marine Corps Air Ground Combat Center in 29 Palms (Pratt 2005). In addition I did a terrestrial Arthropod survey outside of the Mojave Desert for Vandenberg AFB from 2004-2005 (Pratt 2006). I have been doing an invertebrate survey since 2000 through 2009 at various springs in CLNAWS and from 2009 to present I have been doing an endangered plant census along with an invertebrate survey (Pratt 2013).

From the work I did this summer I collected several thousand invertebrates to be identified this winter. Many of these have been mounted, labeled, and processed. The biologists that work for CLNAWS have collected the malaise trap contents at three different springs at least once a month which probably totals well over 20,000 invertebrates. The trap contents are presently stored in alcohol and will be examined through a dissecting microscope to determine species of interest to be mounted and labeled this winter. All of these invertebrates need to be processed and identified over the winter months.

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Butterfly larvae have specific food plants, so during the butterfly survey from 1994-1996 I identified many different food plants on the different military bases. The herbarium at UCR helped in the identification of plants that I was not familiar with. During the arthropod and invertebrate surveys I used plant diversities to identify unique habitat. The endangered Lane Mountain Milkvetch (*Astragalus jaegerianus*) occurs on FINTC and while doing the butterfly survey in 1994 I a couple of days searching for the milkvetch in the Paradise Range. The reason I studied the milkvetch was it was hoped that I would find unique insects associated with the plant. While surveying for the milkvetch I took video recordings of the plant growing up through supporting plants (mostly *Ambrosia dumosa*).

Literature cited

Pratt, G. F. 1998. Terrestrial Invertebrates of Edwards Air Force Base, 1996. Technical Report EL-98-xx of the U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS 39180.

Pratt, G. F. 1999a. Butterflies and Moths of the Western Mojave Desert (China Lake Naval Air Weapons Station, Fort Irwin National Training Center, and Edwards Air Force Base), Entomology Department, University of California Riverside, CA 92521, 148 pp.

Pratt, G. F. 1999b. Terrestrial Invertebrates of Edwards Air Force Base, 1997. Technical Report EL-99-xx of the U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS 39180.

Pratt, G. F. 2000. Terrestrial Invertebrates of Edwards Air Force Base, 1996-1998 final report. Technical Report EL-00-xx of the U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS 39180

Pratt, G. F. 2005. Terrestrial Arthropods of the Marine Corps Air Ground Combat Center, Twentynine Palms, California 2001-2005, Entomology Department at the University of California at Riverside, 102 pp.

Pratt, G. F. 2006. Terrestrial Arthropods of Vandenberg Air Force Base, Lompoc, California, Entom 2004-2005, Entomology Department at the University of California at Riverside, 30 pp.

Pratt G. F. 2013. Invertebrate Survey and Endangered Plant Census of China Lake Naval Air Weapons Station. 365 pp.

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TEACHING

Demonstrator: Queen's University, Kingston Ontario, Canada

Introductory Cell Biology, 1976
Ecology, 1977
Entomology, 1977-1979

Teaching Assistant: University of California, Riverside, CA

Embryology, 1982
Biology 1B, 1983
Parasitology, 1983
Insect Systematics, 1983-1986
Immature Insect Taxonomy, 1984-1986
Field Entomology, 1985

Instructor: University of California Extension, Riverside, CA

Biology and Ecology of Southern California Butterflies, 1998-2001
Field Entomology, 2001

Instructor: Quino Checkerspot Butterfly Workshop, fall 1997, winter 1998, fall 1998, winter 1999, winter 2000

Academic Research

Queen's University, Masters Research: Isolation and Characterization of mRNA for the proteins Calliforin and Vitellogenin of the Blowfly *Calliphora erythrocephala*. Dr. B. N. White and Dr. G. R. Wyatt, Department of Biology, Sept. 1976- Oct. 1979.

University of California, Riverside, CA., Phd. Research: Evolution and Biology of *Euphilotes* biotypes (Lepidoptera: Lycaenidae) using electrophoretic, biological, and morphological characters. Dr. John D. Pinto, Dept. of Entomology and Dr. Clay Sassaman, Dept. of Biology, Sept. 1980- Dec. 1988.

University of Delaware, Newark, DE, Post-doc Research: Evolution and population structure of the *Enchenopa binotata* complex using morphological, biological, and electrophoretic characters. Dr. Tom Wood, Dept. of Entomology and Applied Ecology, July 1989- June 1991.

University of Delaware, Newark, DE., Post-doc Research: Evolution of various North American Groups of Insects to Identify various Vicariant Mechanisms using morphological, biological, and electrophoretic characters in association with biogeographical patterns of distribution. Dr. Tom Allen, Dept. of Entomology and Applied Ecology, September 1991- January 1993.

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University of California, Riverside, CA, Post-doc Research:

1993-1994 Identification of electrophoretic markers of *Aphytis melinus* and *A. liganensis* (parasites of California red scale) for population studies and determining efficacy of biological control releases. Dr. Bob Luck, Dept. of Entomology, July 1993-1994.

1994-1998 Butterfly Survey of three military bases in the Mojave Desert. These bases are located at China Lake Naval Weapons Center, Fort Irwin Military Reservation, and Edwards Air Force Base and cover about 4,000 square miles of the Mojave Desert.

1996-1999 Invertebrate Survey of Edwards Air Force Base. This research was to determine areas of high species richness and endemics, for management purposes.

1997-1998 Invertebrate Survey of Fort Irwin Acquisition Areas to follow before and after military training.

1997-2002 Study of Invertebrates that indicate damage level of habitat out at Fort Irwin National Training Center. This is heavily trained area that has many local areas that differ in their damage level due to training.

1997-present Survey of endangered Quino Checkerspot through the California Fish and Game. This survey also involves rearing and studying the checkerspot under laboratory conditions.

1999 Survey of the endangered Laguna Skipper in the Palomar and Laguna Mts through the Cleveland National Forest. This study is to determine present condition of the skipper in the Laguna Mountains, survey for additional food plants, and to monitor the skipper in the Palomar Mts.

1998 An author of the Recovery Plan for the El Segundo Blue for USFWS.

1999-present Survey of invertebrates found around springs in China Lake Air Naval Weapons Station.

2001-present Survey for arthropods Installation Wide at Twentynine Palms Marine Base.

2000-2003 I was part of the Quino Technology Team, which was involved in the decision process of the endangered Quino Checkerspot butterfly.

2000-2001 survey for the Sacramento Mountains Blue, *Icaricia icarioides* subspecies.

2000-2001 survey for the Sacramento Mountains Green Hairstreak, *Callophrys affinis* subspecies.

2000-2001 survey for the butterflies found in the southwest corner of New Mexico.

2002-2005 survey for arthropods in Marine Corps Air Ground Combat Center (U.S. Navy).

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2003-2004 survey for the Hunter Mountain Copper a subspecies which John Emmel and I named.

2003-2005 survey for the Lotis Blue in Mendocino and Sonoma Counties.

2004-2006 survey for arthropods in Vandenberg Air Force Base.

2003-2007 consult and monitor for the Palos Verdes Blue.

2003-2007 examine genetic differences in populations of members of the *Apodemia mormo* complex and populations of *Glaucopsyche lygdamus* in the western Mojave Desert (Cal State University at Dominguez Hills).

2007 surveyed for the El Segundo Blue Butterfly (ESBB) and trained biologists to survey for ESBB to Liz Bell, Morgan Ball, Alice Abela, and John Labonte.

2004-2008 perform field experiments on larval diapause in the Quino Checkerspot.

2007-2008 examined DNA of *Euphilotes* populations to determine the relationships of the Vandenberg Air Force Base population of the El Segundo Blue Butterfly to the populations at the El Segundo Dunes and neighboring Palos Verdes Peninsula.

2008 University of California, Riverside, CA, Research Assistant:

2008-2010 surveyed to collect larvae and adult Quino Checkerspot Butterflies to transfer them to restored habitat at the La Posta Mountain Warfare Training Facility.

2009-2010 determined the distance and depth that El Segundo Blue Butterfly larvae crawl on and into the ground to pupate.

2004-2010 captive breed the endangered Quino Checkerspot Butterfly.

2009-present survey for arthropods at springs and Lane Mountain Milkvetch on the south range of China Lake Naval Air Weapons Station.

2010-2014 University of California, Riverside, CA, Research Associate:

USFWS Permit – TE004939-10

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This permit was recently updated in January 2011. The permit is for captive breeding of the endangered Palos Verdes Blue, and rear El Segundo Blue Butterfly larvae from females from Vandenberg Air Force Base. Included in the permit is to survey for and identify the Laguna Mountain Skipper, Palos Verdes Blue, El Segundo Blue, and Lotis Blue

PUBLICATIONS:

Ballmer, G. R. & G. F. Pratt. 1989. A Survey of the Last Instar Larvae of the Lycaenidae (Lepidoptera) of California. J. Res. Lep. 27: 1-80.

Ballmer, G. R. & G. F. Pratt. 1989. Instar Number and Larval Development in *Lycaena phlaeas hypophlaeas* (Boisduval) (Lepidoptera: Lycaenidae). J. Lep. Soc. 43: 59-65.

Ballmer, G. R. & G. F. Pratt. 1992. Quantification of Ant Attendance of Lycaenid Larvae. J. Res. Lep. 30: 95-112.

Ballmer, G. R. & G. F. Pratt. 1992. *Loranthomitoura*, a new genus of Eumaeini (Lycaenidae). Trop. Lep. vol. 3: 37-46.

Emmel, J. F. & G. F. Pratt. 1998. New Subspecies of Lycaeninae from California and a Type Locality Restriction for *Chrysophanus cupreus* W. H. Edwards (Lepidoptera: Lycaenidae). In Systematics of Western North American Butterflies. Editor Thomas C. Emmel. Mariposa Press, Gainesville, Florida.

Emmel, J. F., T. C. Emmel, & G. F. Pratt. 1998. Five new subspecies of *Apodemia mormo* (Lepidoptera: Riodinidae)from southern California. In Systematics of Western North American Butterflies. Editor Thomas C. Emmel. Mariposa Press, Gainesville, Florida.

Fourney, R. M., G. F. Pratt, D. G. Harnish, G. R. Wyatt, & B. N. White. 1982. Structure and Synthesis of Vitellogenin and Vitellin from *Calliphora erythrocephala*. Insect Biochem. 12: 311-321.

Longcore, T., R. Mattoni, G. Pratt, & C. Rich. 1997. On the Perils of Ecological Restoration: Lessons from the El Segundo Blue Butterfly. 2nd Interface Between Ecology and Land Development in California. J. E. Keeley, Coordinator. Occidental College.

Mattoni, R., G. F. Pratt, T. R. Longcore, J. F. Emmel, and J. N. George. 1997. The endangered quino checkerspot butterfly, *Euphydryas editha quino* (Lepidoptera: Nymphalidae). J. Res. Lep. 34: 99-118.

Pratt, G. F. 1987. Competition as a Controlling Factor of *Euphilotes battoides allyni* (Lepidoptera: Lycaenidae) Larval Abundance. Atala 15: 1-9.

Pratt, G. F. 1988. The Evolution and Biology of *Euphilotes* Biotypes. Unpublished doctoral dissertation, University of California, Riverside, 653 pp.

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Pratt, G. F. 1994. Evolution of *Euphilotes* (Lepidoptera: Lycaenidae) by seasonal and host shifts. Biol. Jour. Linn. Soc. 51: 387-416.

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Pratt, G. F. 1999. Terrestrial Invertebrates of Edwards Air Force Base, 1997. Technical Report EL-99-xx of the U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS 39180

Pratt, G. F. 1999. Butterflies and Moths of the Western Mojave Desert (China Lake Naval Air Weapons Station, Fort Irwin National Training Center, and Edwards Air Force Base), Entomology Department, University of California Riverside, CA 92521, 148 pp.

Pratt, G. F. 1999. The Battoides Group. In A Field Guide to Western Butterflies. Paul Opler, Houghton Mifflin Company. 540 pp.

Pratt, G. F. 1999. Laguna Mts. Skipper in the Cleveland National Forest 1999 Survey. Entomology Department of the University of California, Riverside, CA 92521.

Pratt, G. F. 2000. Terrestrial Invertebrates of Edwards Air Force Base, 1996-1998 final report. Technical Report EL-00-xx of the U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS 39180

Pratt, Gordon F. 2001. The Quino Checkerspot: Its Biology and Life History Final Report. Report published through the University of California for the California Fish and Game Account Title CDFG FG7182ES Luck 6/98, 96 pp.

Pratt, G. F. 2005. Terrestrial Arthropods of the Marine Corps Air Ground Combat Center, Twentynine Palms, California 2001-2005, Entomology Department at the University of California at Riverside, 102 pp.

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Pratt, G. F. 2008. Buckwheat Blues: Part 1, Introduction and Rita, Spalding's, and Small Blues. American Butterflies 16: 4-32.

Pratt, G. F. 2010. Report on larval movement during the wandering stage of the El Segundo blue, Entomology Department at the University of California at Riverside, 3 pp.

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Pratt G. F. 2013. Invertebrate Survey and Endangered Plant Census of China Lake Naval Air Weapons Station. 365 pp.

Pratt, G. F. & W. Alley. 1998. The Arthropods of the Langford Lake Impact Zone 1997. In 1997 Biological Monitoring and Environmental Impact Assessment. Dominguez Hills Corporation, 1000 East Victoria Street, Carson, California 90747.

Pratt, G. F. & W. Alley. 1999. Arthropod Survey of Fort Irwin Acquisition Sites 1998. Dominguez Hills Corporation, 1000 East Victoria Street, Carson, California 90747.

Pratt, G. F. & W. Alley. 1998. The Arthropods of the Silurian Valley 1997. In Biological Surveys at Proposed Land Acquisition Sites Silurian Valley. Dominguez Hills Corporation, 1000 East Victoria Street, Carson, California 90747.

Pratt, G. F. & W. Alley. 1999. The Arthropods Survey of Langford Lake Impact Zone and Red Pass Lake Sites 1998. Department of Entomology University of California, Riverside, CA92521.

Pratt, G. F. & G. R. Ballmer. 1986. Clarification of the Larval Host Plant of *Epidemia mariposa* (Lycaenidae) in Northern California. J. Lep. Soc. 40: 127.

Pratt, G. F. & G. R. Ballmer. 1987. The Phenetics and Comparative Biology of *Euphilotes enoptes* (Boisduval) (Lycaenidae) from the San Bernardino Mountains. J. Res. Lep. 25: 121-135.

Pratt, G. F. & G. R. Ballmer. 1991. Three biotypes of *Apodemia mormo* in the Mojave Desert. J. Lep. Soc. 45: 46-57.

Pratt, G. F. & G. R. Ballmer. 1991. Acceptance of *Lotus scoparius* (Fabaceae) by larvae of Lycaenidae. J. Lep. Soc. 45: 12-28.

Pratt, G. F. & G. R. Ballmer. 1993. Correlations of diapause intensities of *Euphilotes* spp. and *Philotiella speciosa* (Lepidoptera:Lycaenidae) with host bloom period and elevation. Ann. Ent. Soc. 86: 265-272.

Pratt, G. F., G. R. Ballmer, & D. Wright. 1991. Multivariate and phylogenetic analyses of larval and adult characters of the Editha Complex of the genus *Lycaena* (Lepidoptera: Lycaenidae). J. Res. Lep. 30: 175-195.

Pratt, G. F., G. R. Ballmer, & D. M. Wright. (submitted for publication) Allozyme phylogenies of North American *Callophrys* (s.l.) (Lycaenidae: Lepidoptera). Journal of the Lepidopterists' Society. January 11, 2009, 36 pp.

Pratt, G. F. & J. F. Emmel. 1998. Revision of the *Euphilotes enoptes* and *E. battoides* complexes (Lepidoptera: Lycaenidae). In Systematics of Western North American Butterflies. Editor Thomas C. Emmel. Mariposa Press, Gainesville, Florida.

O-7-14
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Pratt, G. F. & J. F. Emmel. 1998. A New Subspecies of *Euphilotes pallescens* (Lycaenidae) from the Death Valley Region of California. In Systematics of Western North American Butterflies. Editor Thomas C. Emmel. Mariposa Press, Gainesville, Florida.

Pratt, G. F. & J. F. Emmel. 2008b. Buckwheat Blues: Part 2 Dotted Blue and Square-spotted Blue Complexes. American Butterflies 16: 4-29.

Pratt, G. F. & J. F. Emmel. 2010. Sites chosen by diapausing or quiescent stage Quino Checkerspot Butterfly, *Euphydryas editha quino*, (Lepidoptera: Nymphalidae) larvae. Journal of Insect Conservation 14 (2): 107-114.

Pratt, G. F., J. F. Emmel, & G Bernard. 2011. Buckwheat Metalmarks. American Butterflies 1: 4-31.

Pratt, G. F., E. W. Hein, & D. M. Krofta. 2001. Newly discovered populations and food plants extend the range of the endangered quino checkerspot butterfly, *Euphydryas editha quino* (Nymphalidae) in Southern California. J. Lep. Soc. 55: 176-178.

Pratt, G. F. & C. L. Pierce. 2001. *Incisalia henrici* (Lepidoptera: Lycanidae) reared on reproductive and nonreproductive tissues of three different plant species. Proc. Entomol. Soc. Wash. 103: 403-408.

Pratt, G. F. & C. L. Pierce. 2010. A new larval food plant, *Collinsia concolor*, for the endangered quino checkerspot, *Euphydryas editha quino*. Journal of the Lepidopterists' Society 64: 36-37.

Pratt, G. F. & W. D. Wiesenborn. 2009. MacNeill's Sootywing (Hesperopsis gracielae) (Lepidopters: Hesperidae) behaviors observed along transects. Proceedings of the Entomological Society of Washington 111: 698- 707.

G. F. Pratt and W. D. Wiesenborn. 2011. Geographic Distribution of MacNeill's Sootywing (*Hesperopsis gracielae*) (Lepidoptera: Hesperidae) Along the Colorado River. Proc. Entomol. Soc. Wash 113: 1-11.

Pratt, G. F. & T. K. Wood. 1992. A phylogenetic analysis of the *Enchenopa binotata* species complex (Membracidae: Homoptera) using nymphal characters. Syst. Entomol. 17: 351-357.

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Pratt, G. F. & T. K. Wood. 1993. Genitalic analysis of males and females in the *Enchenopa binotata* Say complex (Membracidae: Homoptera). Proc. Entomol. Soc. Wash. 95: 574-582.

Pratt, G. F., D. M. Wright, & H. Pavulaan. 1994. The various taxa, hosts, and evolution of the North American *Celastrina* (Lepidoptera: Lycaenidae). Proc. Entomol. Soc. Wash 96: 566-578.

Pratt, G. F. & D. M. Wright. 2002. An Allozyme Phylogeny of North American Coppers (Lycaenidae: Lepidoptera). Pan Pac. Ent. 78: 219-229.

Pratt, G. F., D. M. Wright, and G. R. Ballmer 2006. Allozyme Phylogeny of North American Blues (Polyommatini: Lycaenidae). Pan Pac. Ent. 82: 283-295.

Riefner, R. E., G. F. Pratt, & R. J. Shlemon. 2003. A rare soil lichen, and endangered butterfly, and open habitat soils; Interacting components requiring protection in southern California. Crossosoma 28: 1-8.

Sassaman, C. & G. F. Pratt. 1992. *Melanophora roralis* (L.) (Diptera: Rhinophoridae), a parasite of isopod crustaceans, in laboratory culture. The Entomologist. 111 (4) 178-186.

Wiesenborn, W. D. & G. F. Pratt. 2008. Selection of *Atriplex lentiformis* Host Plants by Ovipositing *Hesperopsis gracielae* Skippers. Florida Entomologist, 91: 192-197.

Wiesenborn, W. D. & G. F. Pratt. (in press) Visitation of *Sesuvium* and *Heliotropium* Flowers by *Hesperopsis gracielae* (Lepidoptera: Hesperiidae) Florida Entomologist, Oct. 30, 2008, 19 pp.

PRESENTATIONS:

The Lycaenid Larvae of the San Bernardino Mountains; G. F. Pratt; Pacific Slope Meetings of the Lepidopterists' Society; San Bernardino Mountains, Calif.; June, 1985.

The Enzyme Polymorphisms of *Euphilotes enoptes* and *Euphilotes battoides*; G. F. Pratt; Meetings of the Lepidopterists' Society; Berkeley, Calif.; July, 1986.

Euphilotes enoptes and *Euphilotes battoides* and its host-plants; G. F. Pratt; Lorquin Society; Los Angeles County Museum, Calif.; October, 1987.

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Cont.

The Evolution and Biology of *Euphilotes* biotypes; G. F. Pratt; Invited Speaker to the Pacific Slope Meetings of the Lepidopterists' Society; Pikes Peak Research Station, Colorado; July 1988.

Quantification of Ant Attendance of Lycaenid Larvae; G. F. Pratt and G. R. Ballmer; Pacific Slope Meetings of the Lepidopterists' Society; Pikes Peak Research Station, Colorado; July 1988.

Evolution of *Euphilotes* biotypes; G. F. Pratt; The American Entomological Society; The Academy of Natural Sciences of Philadelphia; February 28, 1990.

Morphological and Electrophoretic analyses using the same individuals of the different host races of *Enchenopa binotata*; G. F. Pratt, S. Datz, and T. K. Wood; Auchenorhyncha Meetings; Wooster, Ohio; August 13-17, 1990.

Genetic Correlate of Pronotal Shape of the *Enchenopa binotata* Complex (Homoptera: Membracidae); G. Pratt, T. K. Wood, and S. Datz; Eastern Branch ESA 63rd Annual Meeting; September 22-25, 1991.

Evolution of *Euphilotes* host races; The Entomological Society of Southern California; The Los Angeles Co. Arboretum; September 4, 1993.

The Endangered Quino Checkerspot. Association of Environmental Professionals San Diego Chapter, P.O. Box 82604, San Diego, CA 92138, June 1998.

Butterflies of Southern California. To San Diego Audubon Society. At San Diego Zoo. April 1999.

Sympatric evolution of *Euphilotes* host races. At Cal State University at Long Beach, January 27, 2005.

Butterflies of the San Bernardino Mountains Pebble Plains. At San Bernardino Valley Audubon Society, October 19, 2005.

Little Blue butterflies and their problems crossing roads. Joshua Tree Community Center on October 18, 2006, for South Coast Missing Linkages.

O-7-14 Cont.

The dotted Blues (*Euphilotes* species) and buckwheats (*Eriogonum* species). California Native Plant Society, Victorville Chapter. May 17, 2007.

The Quino Checkerspot Fading with California's Wildflowers. The Orange County Chapter of the Society for Conservation Biology at the University of California, Irvine. December 3, 2009

The Quino Checkerspot Fading with California's Wildflowers. The Entomology Research Museum at the University of California, Riverside. February 13, 2010.

The Complexities of Butterfly Gardening for the Sierra Club at the Rancho California Water District Building, 42135 Winchester Road. February 25, 2010.