APPENDIX B-2

2011 Focused Quino Checkerspot Butterfly Survey for the Jewell Valley Wind Project

DUDEK

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July 18, 2011 6759-4.7

U.S. Fish and Wildlife Service
Attention: Recovery Permit Coordinator
6010 Hidden Valley Road
Carlsbad, California 92011

Subject: ***2011 Focused Quino Checkerspot Butterfly Survey for the Jewell Valley Wind Project, San Diego County, California***

Dear Recovery Permit Coordinator:

This letter report documents the Spring 2011 results of a focused survey conducted by Dudek for the federally-listed endangered Quino checkerspot butterfly (*Euphydryas editha quino*; QCB) for the Jewell Valley Wind Project, a proposed wind energy development project in the southeastern portion of the County of San Diego, California.

PROJECT LOCATION AND EXISTING CONDITIONS

The proposed Jewell Valley Wind Project site is approximately 6,660 acres in southeastern San Diego County, approximately 60 miles east of the City of San Diego near the town of Boulevard, CA (Figure 1). The project site includes two components consisting of the Northern Ranch located to the north of Interstate 8 (I-8) and the Southern Ranch located to the south of I-8. The site lies between two major drainage divides: the Tecate Divide to the west, and the In-Ko-Pah Mountains to the east. This area occurs within the Live Oak Springs U.S. Geographic Survey (USGS) topographic quadrangle (Figure 2).

The terrain in the area ranges from valley bottoms to house-sized boulder-covered ridgelines. The elevation ranges across the study area from approximately 3,280 feet above mean sea level (AMSL) to approximately 4,120 feet AMSL.

Soils on site include acid igneous rock land, Calpine coarse sandy loam, Kitchen Creek loamy coarse sand, La Posta loamy coarse sand, La Posta rocky loamy coarse sand, Las Flores loamy fine sand, Loamy alluvial land, Mottsville loamy coarse sand, Riverwash, and Rositas loamy coarse sand.

VEGETATION COMMUNITIES

Nine plant communities and land cover types were mapped within the focused QCB survey area, including: red shank chaparral, semi-desert chaparral, granitic northern mixed chaparral, valley and foothill grassland, field/pasture, open coast live oak woodland, dense coast live oak woodland, upper sonoran subshrub scrub, and freshwater marsh. The acreages of each community type within the project site are shown in Table 1. Descriptions of each vegetation community (with Holland numeric codes) are provided following Table 1. Holland (1986) and Oberbauer (1996) were used to describe vegetation communities on site.

Table 1
Vegetation Communities within the Focused Quino Checkerspot Butterfly Survey Area for the Jewell Valley Wind Project

Vegetation Community	Acreage On Site
Red shank chaparral	427.1
Semi-desert chaparral	264.1
Granitic northern mixed chaparral	263.8
Valley and Foothill Grassland	22.2
Field/pasture	13.8
Open coast live oak woodland	5.8
Upper Sonoran subshrub scrub	3.2
Freshwater marsh	2.6
Dense coast live oak woodland	0.2
Total	1002.8

Red Shank Chaparral (37300)

Red shank chaparral is made up of nearly pure stands of red shank (*Adenostoma sparsifolium*) (Holland 1986). This community is similar to chamise chaparral but is typically taller and somewhat more open (Holland 1986). In the study area, red shank chaparral intergrades with chamise chaparral and scrub oak chaparral. Like chamise chaparral, the understory in red shank chaparral is sparse and composed of flat-topped buckwheat, annual forbs, and brome grasses.

Semi-Desert Chaparral (37400)

Semi-desert chaparral is relatively open, with widely spaced shrubs and openings supporting annuals. This community is similar to mixed chaparral but occurs in areas with hotter, drier summers and colder winters. In the study area, this community is characterized by abundant rock outcrops. Semi-desert chaparral intergrades with flat-topped buckwheat and the other chaparral

communities. Perennial species common to this community include flat-topped buckwheat, silver cholla (*Cylindropuntia echinocarpus*), Mojave yucca, and Mormon-tea (*Ephedra californica*). Scattered occasionally throughout this community are other common chaparral shrubs, including sugarbush, mountain mahogany, and scrub oak. Annual species observed in the openings of this community include goldfields, red-stemmed filaree, golden yarrow (*Eriophyllum confertiflorum*) thread-leafed eriastrum (*Eriastrum filifolium*), chia, desert beauty, Lemmon's linanthus, San Diego gilia, popcorn flower, and red brome.

Granitic Northern Mixed Chaparral (37131)

Granitic northern mixed chaparral is similar to northern mixed chaparral (37130), but with granitic soils. This community consists of broad-leaved sclerophyll shrubs, 2–4 m tall, forming dense, often nearly impenetrable vegetation dominated by Nuttall's scrub oak (*Quercus dumosa*), chamise (*Adenostoma fasciculatum*), and any one of several taxa in *Arctostaphylos* and *Ceanothus*. Plants in this community are typically deep-rooted, with usually little or no understory vegetation, and often considerable accumulation of leaf litter. Granitic northern mixed chaparral is well adapted to repeated fires, to which many species respond by stump sprouting. A dense cover of annual herbs may appear during the first growing season after a fire, followed in subsequent years by perennial herbs, short-lived shrubs and re-establishment of dominance by the original shrub species in this community.

Valley and Foothill Grassland (42000)

Valley and foothill grassland is a native community dominated by large tussocks of perennial native needlegrass (*Nasella* spp.). The habitat is open and typically supports a variety of native and introduced grasses and forbs, often actually exceeding the bunchgrasses in cover. In San Diego County, native perennial herbs such as *Sanicula*, *Sidalcea*, *Sisirynchium*, *Eschscholzia* or *Lasthenia* are present. The percentage cover of native species at any one time may be quite low, but is considered native grassland if 20% aerial cover of native species is present. Other species commonly associated with valley and foothills grassland include wild oat (*Avena fatua*), common goldenstar (*Bloomeria crocea*), ripgut grass (*Bromus diandrus*), foxtail chess (*Bromus madriatensis* ssp. *rubens*), California poppy (*Eschscholzia* spp.), and goldfields (*Lasthenia* spp.).

Open and Dense Coast Live Oak Woodland (71161 and 71162, respectively)

Both open coast live oak woodland and dense coast live oak woodland are generally similar to the coast live oak woodland (71160). Open coast live oak woodland has a canopy with less than 50% cover, while dense coast live oak woodland has a canopy with between 50% and 75% cover. Coast

live oak woodland is an evergreen woodland dominated by coast live oak (*Quercus agrifolia*). The shrub layer is poorly developed, but may include toyon (*Heteromeles arbutifolia*), currant or gooseberry (*Ribes* spp.), laurel sumac (*Malosma laurina*), or dominated by Mexican elderberry (*Sambucus Mexicana*). The herb component is continuous and dominated by ripgut grass and several other introduced taxa. Open coast live oak woodland typically occurs along drainages at desert margin on north-facing slopes or mixed with Engelmann oak (*Quercus engelmannii*). Dense coast live oak woodland mostly occurs at the narrowing of valley flood plains, or valleys with deep alluvium and high perennial groundwater, mostly in riparian habitats.

Field/Pasture (18310)

Field/pasture includes areas of low-intensity agriculture typically involving dry farming or livestock grazing. In the study area, a small area of field/pasture occurs along McCain Valley Road near Interstate 8, where livestock grazing occurs in a floodplain area. In general, this area is characterized by non-native grasses, including *Bromus* and *Hordeum* species, and non-native herbaceous species, including tumble mustard (*Sisymbrium altissimum*) and red-stemmed filaree (*Erodium cicutarium*).

Upper Sonoran Subshrub Scrub (39000)

Upper sonoran subshrub scrub is a low, fairly penetrable scrub of soft-wooded, summer-dormant, drought- tolerant shrubs. Dominance varies among sites, but usually includes interior goldenbush (*Ericameria linearifolia*), interior California buckwheat (*Eriogonum fasciculatum polifolium*), bladderpod (*Isomeris arborea arborea*), or desert tea (*Ephedra californica*), with many annuals derived from nearby grasslands filling the spaces between the shrubs. Upper sonoran subshrub scrub typically occurs in fairly well drained soils derived from sandstone, shale, or even sterile white diatomaceous deposits. In San Diego County this community occurs at high elevations.

Freshwater Marsh (52400)

Freshwater marsh is a wetland habitat type that develops where the water table is at or just above the ground surface, such as around the margins of lakes, ponds, slow-moving streams, ditches, and seepages. It typically is dominated by tall, emergent monocots, such as cattail (*Typha* sp.) and bulrush (*Scirpus* sp.). With elevations on the Jewell Valley study area ranging from 2932–3534 feet AMSL, the freshwater marsh on site could most accurately be described as transmontane freshwater marsh (52420), which occurs from 3500–7500 feet AMSL. Transmontane freshwater marsh differs from coastal and valley freshwater marsh (52410) in having a shorter growing season, confined more strictly to the summer and subject to much lower temperatures in winter, often well below freezing.

Freshwater marsh is considered a wetland community and the marsh on site is under the jurisdiction of the CDFG, pursuant to Section 1601-1603 of the California Fish and Game Code, the ACOE, pursuant to Section 404 of the Clean Water Act, and the RWQCB, pursuant to Section 401 of the Clean Water Act. In addition, this wetland habitat is under the jurisdiction of the County of San Diego.

QUINO CHECKERSPOT BUTTERFLY SURVEY

Methods

The project developer is in the process of developing a site plan that will be based on meteorological data collected from MET facilities to be constructed onsite. Since a site plan was not available at the time Focused QCB surveys were completed, a survey program was developed by Dudek that included surveying specific areas located throughout the project site (Figures 3 and 4). The survey areas were developed by Dudek based on discussions with the project developer that identified potential areas onsite that would likely be most suitable for development and habitat onsite that would likely support QCB.

Focused QCB surveys were conducted over five visits within a 5-week period between March 9 and April 15, 2011. Surveys were conducted by QCB permitted biologists Anita M. Hayworth, Ph.D. (TE781084), Brock A. Ortega (TE813545-5), Jeff D. Priest (TE840619-2), Kam J. Muri (TE051250-0), Tricia Wotipka (TE840619-2), Paul M. Lemons (TE051248-2), Vipul R. Joshi (TE019949-0), Viviane Marquez (TE800930-9) and David Waller (TE025394-2) in accordance with current USFWS protocol (USFWS 2002a, 2002b).

The site was divided into 11 survey polygons, each representing a single day survey effort (i.e., in accordance with USFWS protocol) (Table 2). These survey areas were numbered and assigned to Dudek's permitted biologists. The biologists were provided with 200-scale (1 inch = 200 feet) aerial photographs of each survey polygon. These photographs were used for mapping host plant populations. Binoculars were used to aid in detecting and identifying butterfly and other wildlife species. GPS units also were available for recording locations of host plant populations.

Table 2
2011 Quino Checkerspot Butterfly (QCB) Survey Polygons

Survey Area	Acreage of Survey Area
1	96
2	95
3	93

Table 2
2011 Quino Checkerspot Butterfly (QCB) Survey Polygons

Survey Area	Acreage of Survey Area
4	99
5	84
6	85
7	88
8	93
9	89
10	88
11	93

The survey methods consisted of slowly walking roughly parallel transects throughout all potential habitat within the survey area (i.e., all areas that are not excluded per the survey protocol, generally including sage scrub, open chaparral, grasslands, open or sparsely vegetated areas, hilltops, ridgelines, rocky outcrops, trails and dirt roads). Survey routes were arranged to thoroughly cover the survey area at a rate of no more than 10–15 acres per hour.

Surveys were conducted only during acceptable weather conditions (i.e., surveys were not conducted during fog, drizzle, or rain; sustained winds greater than 15 miles per hour measured 4–6 feet above ground level; temperature in the shade at ground level less than 60° Fahrenheit (F) on a clear, sunny day; or temperature in the shade at ground level less than 70°F on an overcast or cloudy day). Survey times, personnel, and conditions during the QCB survey are shown in Table 3. Photocopies of the surveyor's field notes are included as Appendix A.

Table 3
Schedule of Focused Quino Checkerspot Butterfly Surveys and Environmental Conditions

Survey Area	Date	Time	Range of Conditions			Personnel*
			Temperature Range (°F)	*Percent Cloud Cover (% cc)*	*Wind (miles per hour (mph))*	
Week 1						
1	3/11/11	0805–1400	64–81	0–0	3–5 to 6–10	AMH
2	3/9/11	0946–1530	60–60	0–0	0–10, gusts to 30	BAO
3	3/11/11	1000–1600	63–70	0–0	3–5 to 5–10, gusts to 15	BAO
4	3/11/11	0830–1505	61–80	0–20	3–6 to 4–8, gusts to 15	JDP
5	3/15/11	0850–1500	63–70	0–10	0–4 to 6–10, gusts 10–15	PML
6	3/15/11	1000–1600	68–72	5–15	2–3 to 2–5, gusts 8–15	VRJ
7	3/10/11	0910–1500	64–78	0–0	0–3 to 3–6, gusts 12–20	PML

Table 3
Schedule of Focused Quino Checkerspot Butterfly Surveys and Environmental Conditions

Survey Area	Date	Time	Range of Conditions			Personnel*
			Temperature Range (°F)	*Percent Cloud Cover (% cc)*	*Wind (miles per hour (mph))*	
8 (north half)	3/11/11	0840–1400	60–69	0–5	0–5 to 4–10, gusts 10–15	PML
8 (south half)	3/11/11	0915–1530	68–86	0–0	4–7	TLW
9	3/10/11	0930–1530	64–67	0–0	0–1 to 0–5	VRJ
10	3/14/11	0915–1515	66–80	10–35	3–6 to 6–9	TLW
11	3/11/11	0945–1545	62–64	0–40	7–8 to 5–10	KJM
Week 2						
1	3/18/11	0930–1530	62–65	20–0	5–10, gusts to 15	BAO
2	3/18/11	0945–1515	64–64	20–0	1–3 to 5–10, gusts 10–15	AMH
3	3/15/11	1000–1610	65–70	0–20	5–10, gusts to 15	BAO
4	3/18/11	0930–1600	60–73	60–5	0–3 to 8–12, gusts to 15	JDP
5	3/29/11	1100–1630	66–70	10–10	5–10 to 3–5	BAO
6	3/17/11	0845–1525	64–69	10–40	0–5 to 2–9, gusts 10–14	PML
7	3/17/11	0905–1515	61–72	0–0 hazy	2–3 to 5–8	TLW
8	3/23/11	0945–1600	64–62	0–0	0–2 to 4–6	TLW
9	3/28/11	1100–1700	64–66	0–0	3–8, gusts to 15	VRJ
10	3/18/11	0905–1505	70–68	0–0 hazy	4–6 to 6–9	TLW
11	3/18/11	1000–1600	60–60	50–0	4–8 to 6–10, gusts to 12	KJM
Week 3						
1	3/29/11	0930–1615	64–72	0–80	3–5 to 5–8	AMH
2	3/23/11	1000–1630	60–64	0–15	2–4 to 8–12, gusts 15–25	JDP
2	4/1/11	1420–1720*	81–88	0–0	0–7	VM & DW
3	3/30/11	1015–1630	73–74	2–60	1–5 to 2–6, gusts to 8	JDP
4	4/5/11	1015–1700	67–72	40–80	3–7 to 2–8, gusts 10–14	PML
5	3/31/11	0920–1535	68–77	5–5	0–4 to 4–8, gusts 9–12	PML
6	3/30/11	0900–1500	64–74	10–20	0–4 to 4–8, gusts 9–15	PML
7	3/29/11	0900–1505	64–76	0–20	5–8 to 2–4, morning gusts to 12	TLW
8	4/1/11	0900–1515	74–86	0–0	2–3	TLW
9	3/30/11	1030–1350*	69–77	5–20	0–8	VM & DW
10	3/30/11	1350–1525*	75–76	25–35	0–8	VM & DW
10	4/1/11	1035–1305*	78–89	0–0	0–7	VM & DW
11	3/28/11	1015–1630	60–62	0–0	4–6 to 3–7	KJM
Week 4						
1	4/1/11	0830–1550	64–64	0–0	3–5	AMH
2	4/13/11	1030–1305*	60–67	0–5	0–7, gusts 7–9	VM & DW
3	4/2/11	0915–1530	68–74	50–60	0–5 to 4–9, gusts to 15	JDP

Table 3
Schedule of Focused Quino Checkerspot Butterfly Surveys and Environmental Conditions

Survey Area	Date	Time	Range of Conditions			Personnel*
			Temperature Range (°F)	*Percent Cloud Cover (% cc)*	*Wind (miles per hour (mph))*	
4	4/1/11	0930–1600	74–88	0–0	0–2 to 0–4	JDP
5	4/4/11	0920–1545	64–72	0–0	3–8 to 4–8, gusts 9–15	PML
6	4/11/11	1000–1600	62–65	50–0	2–6 to 1–4, gusts 5–8	PML
7	4/4/11	0930–1545	70–74	0–0	5–8, gusts to 16	TLW
8	4/5/11	1030–1630	70–70	40–60	4–7 to 4–12, gusts to 20	KJM
9	4/1/11	1000–1500	63–66	0–0	3–5, gusts to 10	BAO
10 north	4/10/11	1405–1545*	62–64	0–0	0–7, gusts 7–9.5	VM & DW
11	4/4/11	1030–1630	62–67	0–0	2–4 to 0–2, gusts 6–10	KJM
Week 5						
1	4/12/11	1005–1605	64–68	0–0	4–8 to 5–10	AMH
1	4/15/11	1030–1400	67–69	0–0	5–9	AMH
2	4/15/11	1030–1630	66–69	0–0	5–7 to 4–7, gusts 10–12	KJM
3	4/14/11	1030–1640	61–64	0–0	3–7 to 2–5	KJM
4	4/11/11	0950–1415	62–65	50–0	3–5	AMH
5	4/12/11	0940–1600	60–65	0–0	2–4 to 2–6, gusts 7–10	PML
6	4/13/11	1040–1630	60–62	0–10	3–8 to 4–8, gusts 10–17	PML
7	4/12/11	1020–1625	62–64	0–0	2–6 to 4–7	KJM
8	4/13/11	1405–1630*	56–62	0–20	0–5, gusts 6–11	VM & DW
9	4/11/11	1015–1450*	60–67	15–70	0–7	VM & DW
10	4/14/11	1100–1700	63–65	0–0	3–5 to 2–10	BAO
11	4/10/11	1000–1405*	58–65	0–0	0–6 gusts 9–13	VM & DW

* Survey areas were split up and surveyed simultaneously by Viviane Marquez and David Waller. Survey times shown should be doubled to determine time spent in each survey area.
AMH = Anita M. Hayworth, PhD (TE-781084-6)
BAO = Brock A. Ortega (TE-813545-5)
JDP = Jeffrey D. Priest (TE-840619-2)
KJM = Kam J. Muri (TE-051250-0)
PML = Paul M. Lemons (TE-051248-4)
TLW = Tricia L. Wotipka (TE-840619-2)
VRJ = Vipul R. Joshi (TE-019949-0)
VM = Viviane Marquez (TE-800930-9)
DW = David Waller (TE-025394-2)

RESULTS

No QCB were observed during the 2011 focused survey. Thirty-three (33) butterfly species were observed during the surveys. The weeks in which these butterflies were observed are shown in Table 4.

Table 4
Butterflies Observed on Site

Scientific Name	Common Name	Week				
		1	*2*	*3*	*4*	*5*
Hesperiidae – Skippers						
Erynnis funeralis	Funeral duskywing	X	X	X	X	X
Erynnis propertius	Propertius duskywing	—	—	—	X	—
Erynnis sp.	Duskywing	X	X	X	X	X
Thorybes pylades	Northern Cloudywing	X	—	—	—	—
Nymphalidae – Brush-footed Butterflies						
Agraulis sp.	Fritillary	—	—	X	—	—
Coenonympha californica californica	California ringlet	X	X	—	X	—
Junonia coenia	Buckeye	—	—	—	X	X
Vanessa annabella	West coast lady	X	X	—	—	X
Vanessa cardui	Painted lady	X	X	X	X	X
Vanessa sp.	Lady	X	X	X	X	X
Lycaenidae – Blues and Hairstreaks						
Brephidium exile	Western pygmy blue	—	—	X	—	—
Callophrys perplexa	Perplexing (green) hairstreak	X	X	X	X	X
Glaucopsyche lygdamus australis	Southern blue	X	X	X	X	X
Icaria acmon acmon	Acmon blue	X	X	X	X	X
Incisalia augustinus	Brown elfin	X	X	X	—	—
Leptotes marina	Marine blue	X	—	—	—	—
Philotes sonorensis	Sonoran blue	—	—	X	—	—
Papilionidae – Swallowtails						
Papilio eurymedon	Pale swallowtail	X	X	X	X	X
Papilio rutulus	Western swallowtail	—	X	—	X	—
Papilo zelicaon lucas	Anise swallowtail	—	—	—	—	X
Peiridae – Whites and Sulfurs						
Anthocharis centhura	Felder's orangetip	X	X	X	X	X
Anthocharis sara	Sara orangetip	X	X	X	X	X
Colias eurydice	California dogface	X	X	—	—	—
Colias harfordi	Harford's Sulfur	X	—	X	X	X
Colias sp.	Sulfur	X	X	X	—	X
Euchloe hyantis	Pearly marble	X	—	X	—	—
Euchloe lotta	Desert marble	—	—	X	X	X
Pieris rapae	European cabbage white	—	X	X	—	—
Pontia beckerii	Becker's white	X	—	X	—	—
Pontia protodice	Common white	X	X	X	X	X
Pontia sisymbrii	California white	X	X	X	—	—

Table 4
Butterflies Observed on Site

Scientific Name	Common Name	Week				
		1	*2*	*3*	*4*	*5*
Riodinidae – Metalmarks						
Apodemia virgulti	Behr's metalmark	X	X	X	X	X
Calephelis wrightii	Wright's metalmark	X	—	—	—	—

One species of QCB larval host plant, common owl's-clover (*Castilleja exserta* ssp. *exserta*), was observed within the study area during focused surveys. Occurrences of the larval host plant are shown on Figure 4. Table 5 includes the known and observed adult QCB nectar plants (according to Mattoni et al. 1997, USFWS 2002a, USFWS 2002b, USFWS 2003). Larval host plants are also included in Table 5 and are in bold print.

Table 5
QCB Larval Food and Adult Nectar Plants[1]

Scientific Name	Common Name	Observed During Focused Survey
Apiaceae – Carrot Family		
Lomatium dasycarpum ssp. *dasycarpum*	woolly-fruit lomatium	—
Lomatium utriculatum	common lomatium	—
Asteraceae – Sunflower Family		
Achillea millefolium	yarrow, milfoil	—
Lasthenia californica	common goldfields	X
Lasthenia coronaria	southern goldfields	—
Layia platyglossa	common tidy tips	X
Boraginaceae – Borage Family		
Amsinckia menziesii	rancher's fireweed	—
Amsinckia menziesii var. *intermedia*	rancher's fiddleneck	X
Amsinckia menziesii var. *menziesii*	rigid fiddleneck	—
Cryptantha spp. or *Plagyobothrys* spp.	popcorn flower	X
Fabaceae – Pea Family		
Lotus spp.	deerweed, spanishclover, lotus	X
Hydrophyllaceae – Waterleaf Family		
Eriodictyon crassifolium var. *crassifolium*	thickleaf yerba santa	—
Eriodictyon trichocalyx var. *trichocalyx*	hairy yerba santa	—
Phacelia distans	wild-heliotrope	X
Lamiaceae – Mint Family		
Salvia columbariae	chia	X
Plantaginaceae – Plantain Family		
Plantago erecta[2]	dot-seed plantain	—

Table 5
QCB Larval Food and Adult Nectar Plants[1]

Scientific Name	Common Name	Observed During Focused Survey
Plantago patagonica	woolly plantain	—
Polemoniaceae – Phlox Family		
Gilia angelensis	grassland gilia	—
Gilia capitata ssp. *abrotanifolia*	ball gilia	—
Linanthus spp.	ground pink	—
Polygonaceae – Buckwheat Family		
Eriogonum fasciculatum var. *foliolosum*	California buckwheat	X
Scrophulariaceae – Figwort Family		
Antirrhinum coulterianum	Coulter's snapdragon	—
Castilleja exserta	common owl's-clover	X
Collinsia sp.	Chinese houses	—
Cordylanthus rigidus ssp. ***setiger***	dark-tipped bird's-beak	—
Keckiella antirrhinoides var. *antirrhinoides*	yellow bush-penstemon	—
Keckiella cordifolia	climbing bush penstemon	—
Liliaceae – Lily Family		
Allium haematochiton	red-skin onion	—
Allium peninsulare	red-flower onion	—
Allium praecox	early onion	—
Dichelostemma capitatum	blue dicks	X
Muilla clevelandii	San Diego goldenstar	—
Muilla maritima	common muilla	—

1 List derived from Mattoni et al. 1997; USFWS 2002a, USFWS 2002b; USFWS 2003 (for *Euphydras editha*)
2 Plants listed in **bold** print are known QCB larval host plant species.

Dudek certifies that the information in this survey report and attached exhibits fully and accurately represents the work conducted by the QCB permitted biologists who conducted this focused survey.

Please feel free to contact us at 760.942.5147, plemons@dudek.com, or bortega@dudek.com if you have any questions regarding the contents of this report.

Sincerely,

Paul M. Lemons
Permit #TE051248-4

Brock A. Ortega
Permit #TE813545-5

Anita M. Hayworth
Permit #TE781084

Kam J. Muri
Permit # TE051250-0

Jeffrey D. Priest
Permit #TE840619-2

Tricia L. Wotipka
Permit # TE840619-2

Recovery Permit Coordinator

Subject: 2011 Focused Quino Checkerspot Butterfly Survey for the Jewell Valley Wind Project, San Diego County, California

Vipul R. Joshi	David Waller	Viviane Marquez
Permit # TE019949-0	Permit #TE025394-2	Permit #TE800930-9

Att: Figure 1, Regional Map
Figure 2, Vicinity Map
Figure 3, Biological Resources Map with Quino Survey Areas – North
Figure 4, Biological Resources Map with Quino Survey Areas – South
Appendix A – List of Wildlife Species Observed during the 2011 Jewell Valley QCB Survey
Appendix B – 2011 Jewell Valley QCB Survey Field Notes

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David Hochart, Dudek

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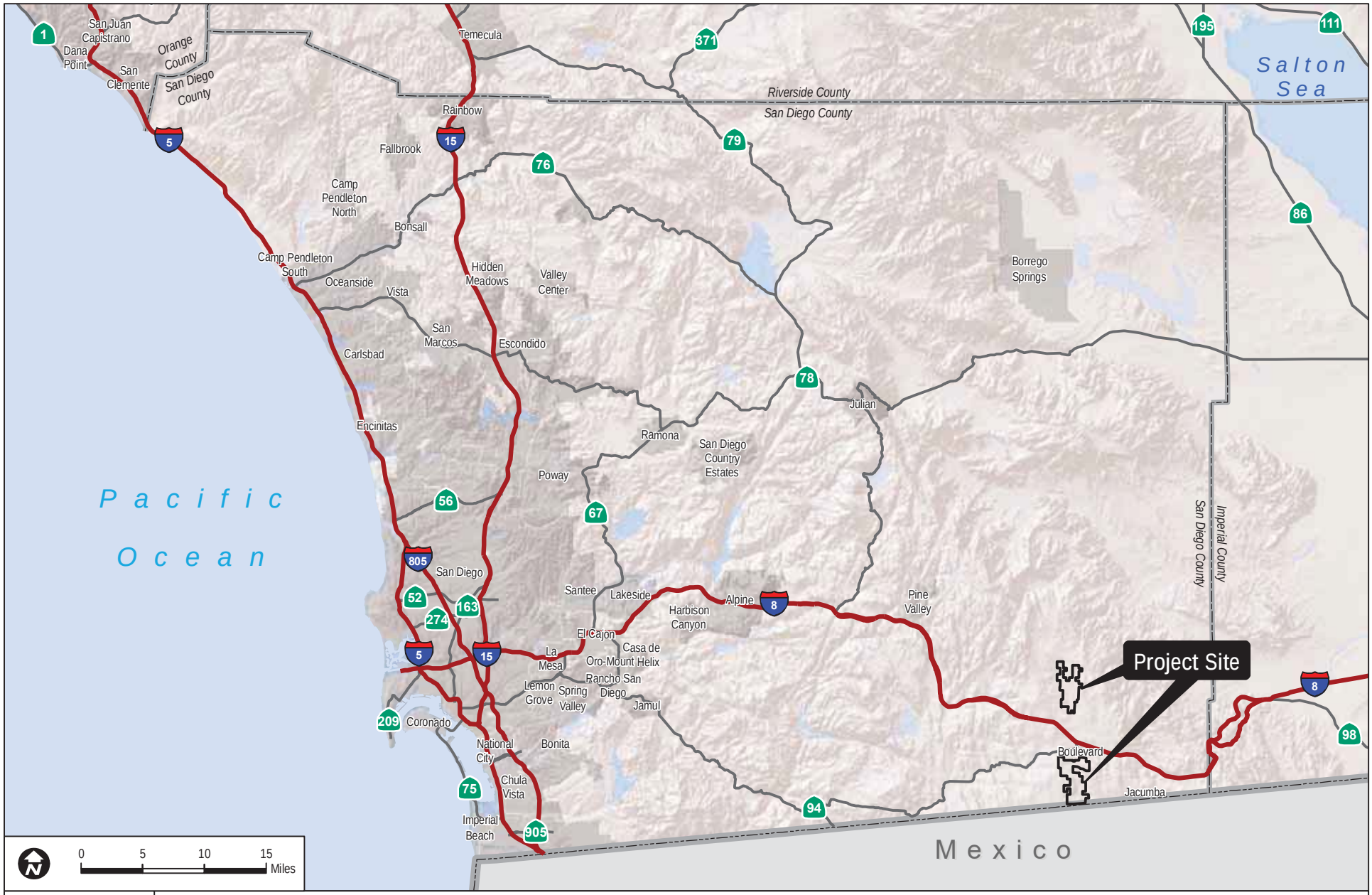


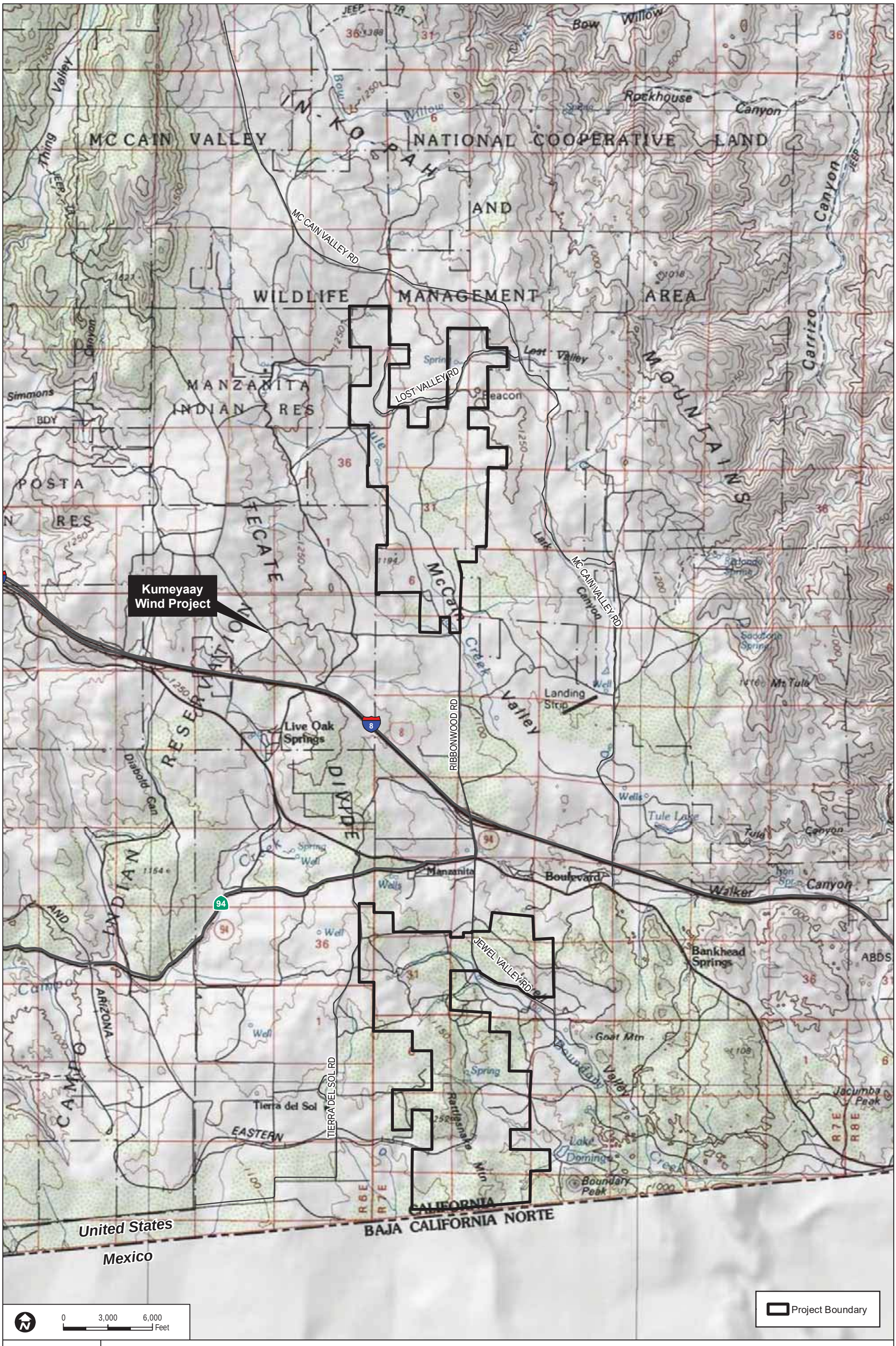
DUDEK

6759-4.7

FIGURE 1

Regional Map

2011 Focused Quino Checkerspot Butterfly Survey Report for the Jewell Valley Wind Project

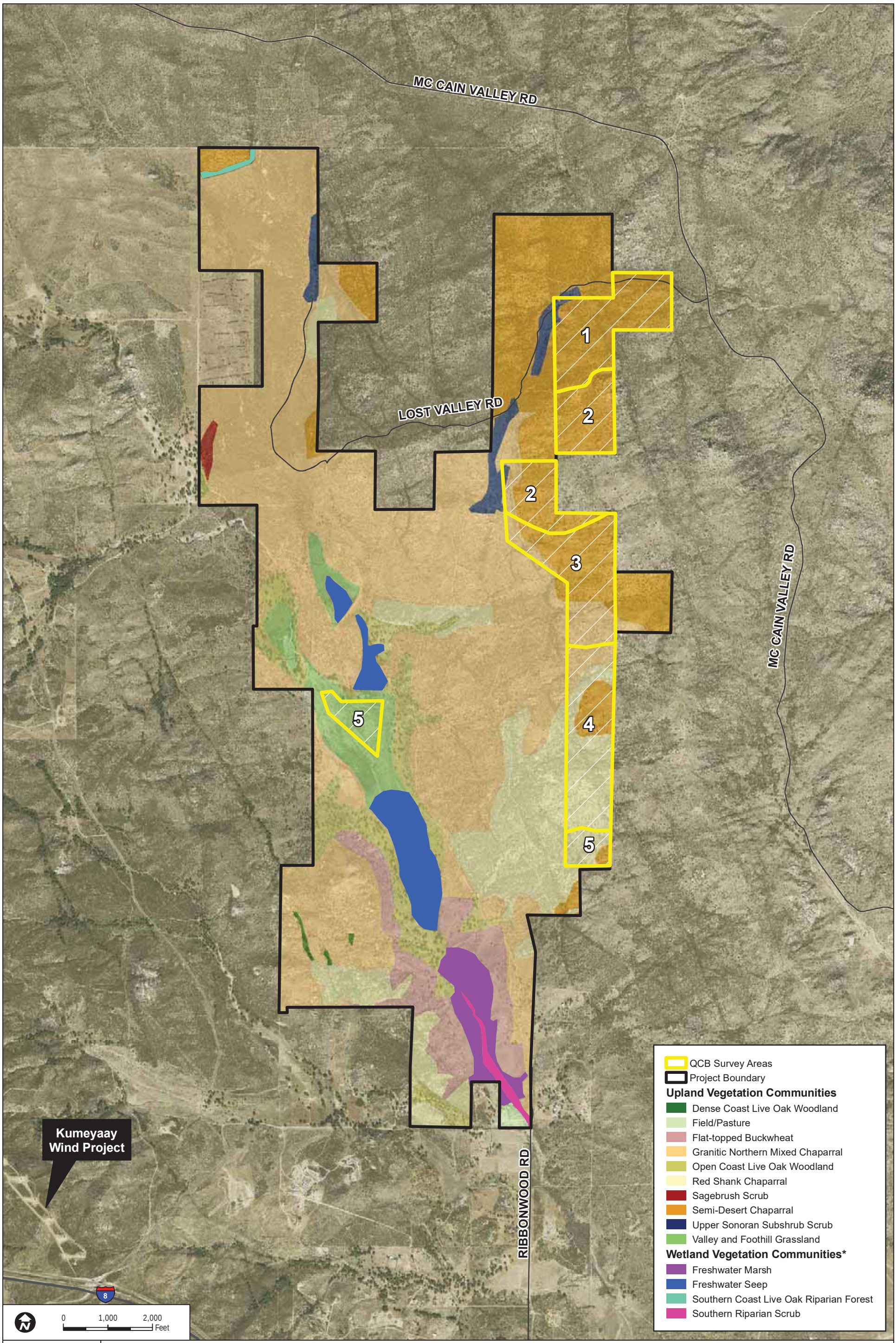


DUDEK

6759-4.7

SOURCE: Digital Globe 2008
SANGIS 2010

FIGURE 2
Vicinity Map



DUDEK

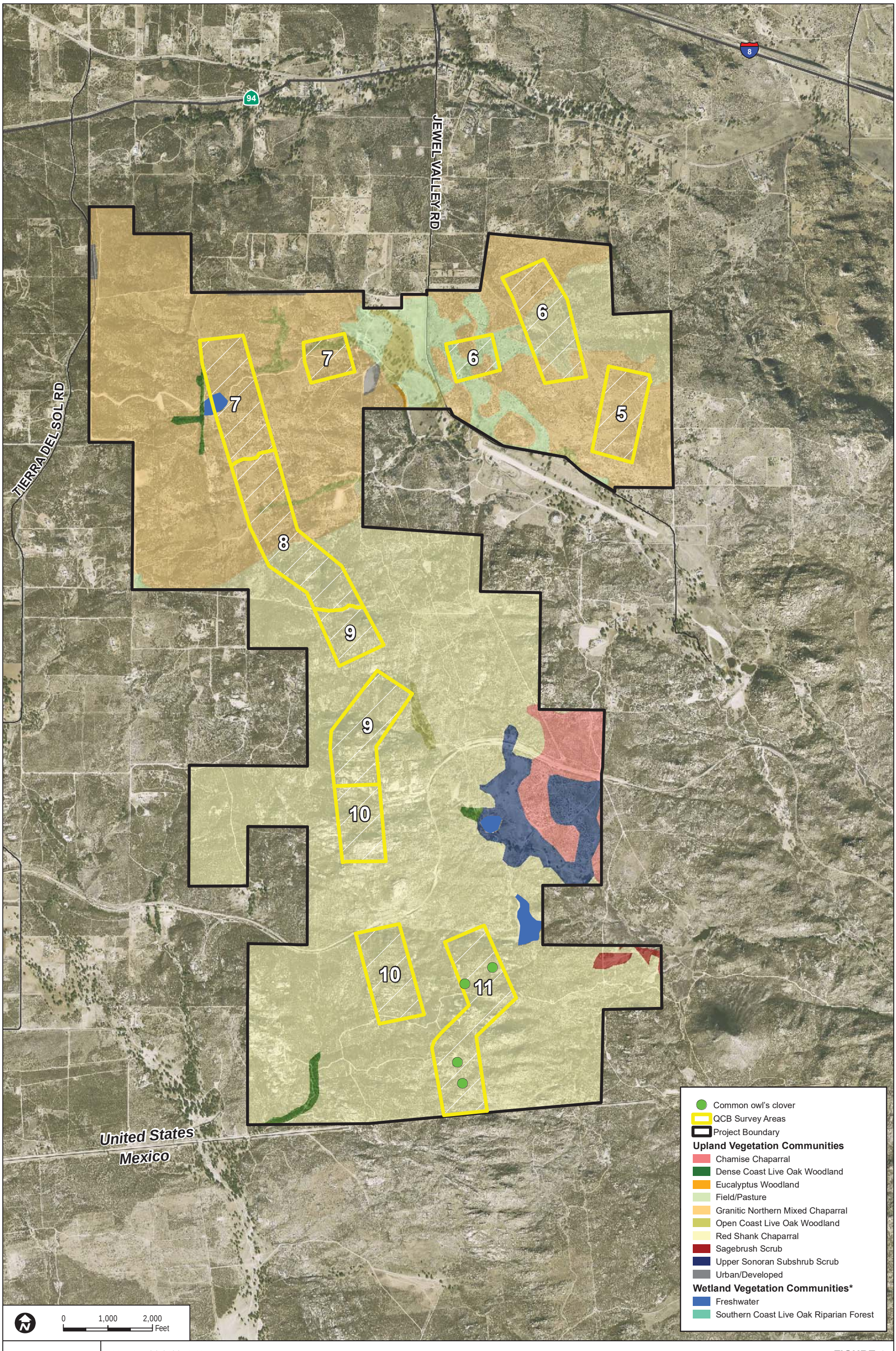
6759-4.7

SOURCE: Digital Globe 2008
SANGIS 2010

FIGURE 3

Biological Resources Map with Quino Survey Areas - North

2011 Focused Quino Checkerspot Butterfly Survey Report for the Jewell Valley Wind Project



DUDEK

6759-4.7

SOURCE: Digital Globe 2008
SANGIS 2010

FIGURE 4

Biological Resources Map with Quino Survey Areas - South

APPENDIX A

List of Wildlife Species Observed during the 2011 Jewell Valley QCB Survey

APPENDIX A
List of Wildlife Species Observed during the 2011 Jewell Valley QCB Survey

WILDLIFE SPECIES – VERTEBRATES

AMPHIBIANS

***BUFONIDAE* – TRUE TOADS**

Bufo boreas – western toad

***HYLIDAE* – TREEFROGS**

Hyla cadaverina – California treefrog
Hyla regilla – Pacific treefrog

REPTILES

***IGUANIDAE* – IGUANID LIZARDS**

Gambelia wislizenii – long-nosed leopard lizard
Phrynosoma coronatum – coast horned lizard
Sceloporus graciosus – sagebrush lizard
Sceloporus occidentalis – western fence lizard
Sceloporus orcutti – granite spiny lizard
Uta stansburiana – side-blotched lizard

***TEIIDAE* – WHIPTAIL LIZARDS**

Cnemidophorus hyperythrus – orange-throated whiptail

***COLUBRIDAE* – COLUBRID SNAKES**

Coluber constrictor – racer
Masticophis lateralis – California whipsnake
Pituophis melanoleucus – gopher snake

***VIPERIDAE* – VIPERS**

Crotalus atrox – western diamondback rattlesnake
Crotalus ruber – red-diamond rattlesnake
Crotalus oreganus helleri – Southern pacific rattlesnake

BIRDS

***ARDEIDAE* – HERONS**

Ardea alba – great egret

***ANATIDAE* – WATERFOWL**
Anas platyrhynchos – mallard

***CATHARTIDAE* – NEW WORLD VULTURES**
Cathartes aura – turkey vulture

***ACCIPITRIDAE* – HAWKS**
Accipiter cooperii – Cooper's hawk
Buteo jamaicensis – red-tailed hawk
Parabuteo unicinctus – Harris's hawk

***FALCONIDAE* – FALCONS**
Falco sparverius – American kestrel

***PHASIANIDAE* – PHEASANTS AND QUAILS**
Callipepla californica – California quail

***CHARADRIIDAE* – PLOVERS**
Charadrius vociferus – killdeer

***COLUMBIDAE* – PIGEONS AND DOVES**
Zenaida macroura – mourning dove

***CUCULIDAE* – CUCKOOS AND ROADRUNNERS**
Geococcyx californianus – greater roadrunner

***STRIGIDAE* – TRUE OWLS**
Bubo virginianus – great horned owl

***APODIDAE* – SWIFTS**
Aeronautes saxatalis – white-throated swift

***TROCHILIDAE* – HUMMINGBIRDS**
Calypte anna – Anna's hummingbird

***PICIDAE* – WOODPECKERS**
Colaptes auratus – northern flicker
Melanerpes formicivorus – acorn woodpecker
Picoides nuttallii – Nuttall's woodpecker
Picoides scalaris – ladder-backed woodpecker

***TYRANNIDAE* – TYRANT FLYCATCHERS**

Sayornis nigricans – black phoebe
Sayornis saya – Say's phoebe
Tyrannus vociferans – Cassin's kingbird
Tyrannus verticalis – western kingbird

***HIRUNDINIDAE* – SWALLOWS**

Petrochelidon pyrrhonota – cliff swallow

***CORVIDAE* – JAYS AND CROWS**

Aphelocoma californica – western scrub-jay
Corvus brachyrhynchos – American crow
Corvus corax – common raven

***PARIDAE* – TITMICE**

Baeolophus inornatus – oak titmouse

***AEGITHALIDAE* – BUSHTITS**

Psaltriparus minimus – bushtit

***TROGLODYTIDAE* – WRENS**

Campylorhynchus brunneicapillus – cactus wren
Salpinctes obsoletus – rock wren
Thryomanes bewickii – Bewick's wren

***SYLVIIDAE* – GNATCATCHERS**

Polioptila caerulea – blue-gray gnatcatcher

***TURDIDAE* – THRUSHES AND BABBLERS**

Sialia mexicana – western bluebird

***TIMALIIDAE* – LAUGHINGTHRUSH AND WRENTIT**

Chamaea fasciata – wrentit

***MIMIDAE* – THRASHERS**

Mimus polyglottos – northern mockingbird
Toxostoma redivivum – California thrasher

***PTILOGONATIDAE* – SILKY-FLYCATCHERS**

Phainopepla nitens – phainopepla

***LANIIDAE* – SHRIKES**

Lanius ludovicianus – loggerhead shrike

***STURNIDAE* – STARLINGS**

* *Sturnus vulgaris* – European starling

***PARULIDAE* – WOOD WARBLERS**

Dendroica coronata – yellow-rumped warbler
Geothlypis trichas – common yellowthroat
Oporonis tolmiei – MacGillivray's warbler
Vermivora celata – orange-crowned warbler
Wilsonia pusilla – Wilson's warbler

***EMBERIZIDAE* – BUNTINGS AND SPARROWS**

Amphispiza bilineata – black-throated sparrow
Chondestes grammacus – lark sparrow
Junco hyemalis – dark-eyed junco
Melospiza melodia – song sparrow
Pipilo crissalis – California towhee
Pipilo maculatus – spotted towhee
Spizella atrogularis – black-chinned sparrow
Zonotrichia leucophrys – white-crowned sparrow

***ICTERIDAE* – BLACKBIRDS AND ORIOLES**

Agelaius phoeniceus – red-winged blackbird
Icterus bullockii – Bullock's oriole
Icterus parisorum – Scott's oriole
Molothrus ater – brown-headed cowbird
Quiscalus mexicanus – great-tailed grackle
Sturnella neglecta – western meadowlark

***FRINGILLIDAE* – FINCHES**

Carpodacus mexicanus – house finch
Carduelis psaltria – lesser goldfinch

MAMMALS

***LEPORIDAE* – HARES AND RABBITS**

Lepus californicus – black-tailed jackrabbit
Sylvilagus bachmani – brush rabbit
Sylvilagus audubonii – desert cottontail

***SCIURIDAE* – SQUIRRELS**

Ammospermophilus leucurus – white-tailed antelope squirrel
Spermophilus beecheyi – California ground squirrel

***GEOMYIDAE* – POCKET GOPHERS**

Thomomys bottae – Botta's pocket gopher

***HETEROMYIDAE* – POCKET MICE AND KANGAROO RATS**

Dipodomys sp. – kangaroo rat (sign)

***MURIDAE* – RATS AND MICE**

Neotoma lepida – desert woodrat
Peromyscys sp. – mouse

***CANIDAE* – WOLVES AND FOXES**

* *Canis familiaris* – domestic dog
Canis latrans – coyote

***PROCYONIDAE* – RACCOONS AND RELATIVES**

Procyon lotor – common raccoon

***MUSTELIDAE* – WEASELS, SKUNKS, AND OTTERS**

Mephitis mephitis – striped skunk
Mustela frenata – long-tailed weasel

***FELIDAE* – CATS**

Felis concolor – mountain lion

***CERVIDAE* – DEERS**

Odocoileus hemionus – mule deer

WILDLIFE SPECIES – INVERTEBRATES

BUTTERFLIES AND MOTHS

***HESPERIIDAE* – SKIPPERS**

Erynnis funeralis – funereal duskywing
Erynnis propertius – propertius duskywing
Erynnis sp. – Duskywing
Thorybes pylades – Northern Cloudywing

***PAPILIONIDAE* – SWALLOWTAILS**

Papilio eurymedon – pale swallowtail
Papilio rutulus – western tiger swallowtail
Papilo zelicaon lucas – anise swallowtail

***PIERIDAE* – WHITES AND SULFURS**

Anthocharis centhura – Felder's orangetip
Anthocharis sara – Sara orangetip
Colias Eurydice – California dogface
Colias harfordi – Harford's Sulfur
Colias sp. – Sulfur
Euchloe hyantis – Pearly marble
Euchloe lotta – Desert marble
Pieris rapae – European cabbage white
Pontia beckerii – Becker's white
Pontia protodice – Common white
Pontia sisymbrii – California white

***RIODINIDAE* – METALMARKS**

Apodemia mormo virgulti – Behr's metalmark
Calephelis wrightii – Wright's metalmark

***LYCAENIDAE* – BLUES, HAIRSTREAKS, AND COPPERS**

Brephidium exile – western pygmy blue
Callophrys dumetorum perplexa – perplexing (green) hairstreak
Glaucopsyche lygdamus australis – southern blue
Icaria acmon acmon – acmon blue
Incisalia augustinus – brown elfin
Leptotes marina – marine blue
Philotes sonorensis – sonoran blue

***NYMPHALIDAE* – BRUSH-FOOTED BUTTERFLIES**

Agraulis sp. – fritillary
Coenonympha californica californica – California ringlet
Junonia coenia – buckeye
Vanessa annabella – west coast lady
Vanessa sp. – lady
Vanessa cardui – painted lady

* signifies introduced (non-native) species

INTENTIONALLY LEFT BLANK

APPENDIX B

2011 Jewell Valley QCB Survey Field Notes

AMth

3/11/2011

0805	1100	1400	Jewel Valley
64	75	81	OQB
3-5MPH	8MPH	6-10	Area 1
Clear	Clear	Clear	

WSJA deer poop + tracks
CAQU
WCSP
CORA
CATH
CBSO
RTHA-overhead
WTSW flyover
WREN
SPTO CATO

Funereal type (skipper) ||| many
Wht+black (skipper) |
blue (marine) |
Brown (Wrights metalmark) |||
White (Beckers) ||||
moth - underwing w yellow spots ~10
Behrs Metalmark ||||
S. Blue |||
Acmon Blue |
"underwing" moth ~15
tan borders |

AMth

0945 Jewel Valley
64 grnd 3/18/2011
60 dir Area 2
high wispy (sun's intermittent) QCB Survey
1-3 MPH

WSJA Pacificfrog
CAQU BTSP
CORA OATI
LEGO Lindbird sp (La or We-Flewby)
BUSH WCSP
SHAI BELOR
SPTO RUHA (on nest in dead tree)
CAJO DEJU
CATH

Behr's metalmark ||||-||| ||| many
Funereal type |||
Perplexing hairstreak ||||
Blackspotted moth ||||
Common white |
Western Coast hoary ||
pale swallowtail |
skipper all black |||
Arnica Blue ||

full sun conditions by 1100 then wind picked up but butterflies were active.

Nectar source (lasth) was abundant between shrubs (photos).

Stopped recording Bmetalmarks they are quite numerous

End
1515
64F
5-10 MPH, gusts to 15
cedar

AMH

0930 4:15 pm 3/29/2011
Clear 809cc Week 3
3-5mph 5-8mph Jewel Valley
64 72° Area 1

URWN CAQU
CATO CATH
DPTO CANT
YRWA BEWR
WSIA GRRO
BTSP WCSP
CAWR TUVU flyover
BTGW DEJU
Striped racer

Sara O. tip ||||
White - Becker or Common 1
Brn Elfin |||
Perplexing ||||
Behr's m.m. ||||
Silv. blue ||
white - large ||
Hartford's sulfur 1
Skipper, large black ||||
Desert marble ||||
Lady sp. 1
Pygmy blue ||

AMth

Patches w/ carpet of annuals in bloom. popcorn, Lasth
Also patches of eriodictyon
Lot of bare sandy exp. soil Also patches with shrub cover.
Some shrub cover is pretty dense w/ shrub oak. In drainage at N. end is patch of redshank/chamise
Lots of scrub jays
conditions were excellent w/ lots wind, sun, warm temps. Lots of butterfly activity - many Behr's (stopped counting)

96

site
P

AMH

4/1/2011

76 F	83F	Jewel Valley
0830	350	QCB
3-5mph	3-5	week 4
Clear	Clear	

Harford	++++ |||
Sara Otip	+++ |||
black skipper	|| – many
Metalmark, Behr's	+++|| many
Blue, Southern	|||
Desert marble	+++
perplexing	+++ ||
Common white	|||
Pale swallow tail	|
very common – flitting around the bucket	
buckeye	|
Blue (acmon)	+++

NCSP	MODO
WREN	BTSP
CATO	NUWO
SPTO	PIHA 1
WSJA	Turk overflight – 3 overhead pretty low
DEJU	CATH
CAQU	ROWR
CORA	SCOR
CAWR	WTSW – also pretty low
small yellow (forgot the name)	||

AMth

Alot more whites (common, marble, sara o'tip) also more sulfurs this week. Metal marks are abundant both small & large. first buckeye this week.

Carpet of spring ephemerals in bloom now. Did a second pass thru the areas with the carpets

AMH

- Spp list for BCB survey
  - WREN
  - BEWR
  - BTSP
  - WCSP
  - NOFL
  - TUVU
  - ~~WESJ~~ WSJA
  - CAWR
  - CORA
  - CAFI
  - CAQU
  - CATO
  - SPTO
  - GRRO
  - WTSW