

**SAFE HARBOR AGREEMENT BETWEEN PACIFIC GAS AND ELECTRIC AND THE U.S. FISH
AND WILDLIFE SERVICE FOR SERPENTINE ENDEMIC SPECIES LOCATED ON
TULARE HILL IN SANTA CLARA COUNTY, CALIFORNIA**

1.0 INTRODUCTION

This Tulare Hill Safe Harbor Agreement (“Agreement”) is between Pacific Gas & Electric (“PG&E” or “Applicant”) and the U.S. Fish and Wildlife Service (“Service”), hereinafter referred to as the “Parties”. This Agreement follows the Service’s Safe Harbor Agreement policy (FR 64:32717) and regulations (FR 64:32706), which implement this policy. In addition, this Agreement will provide a net conservation benefit for serpentine endemic species and provides certain regulatory assurances to PG&E in such habitat creation and enhancement.

This Agreement covers the bay checkerspot butterfly (*Euphydryas editha bayensis*), listed as threatened under the federal Endangered Species Act (“Act”). This Agreement also covers the federally-endangered Metcalf Canyon jewelflower (*Streptanthus albidus albidus*) and the federally-threatened Santa Clara Valley dudleya (*Dudleya setchellii*). These species are considered the “covered species” as defined in the Service’s final Safe Harbor Policy (*Federal Register* 64:32717). By definition, the Service limits “covered species” to federally-listed endangered or threatened species that are the subject of a Safe Harbor Agreement.

2.0 AUTHORITY AND PURPOSE

Sections 2, 7, and 10 of the Endangered Species Act of 1973, as amended, allow the Service to enter into this Agreement. Section 2 of the Act states that encouraging interested parties, through Federal financial assistance and a system of incentives, to develop and maintain conservation programs is key to safeguarding the Nation’s biological resources. Section 7 of the Act requires the Service to review programs that it administers and to utilize such programs in furtherance of the purposes of the Act. By entering into this Agreement, the Service is utilizing its Endangered Species and related programs to further the conservation of the Nation’s fish and wildlife resources.

Section 10(a)(1)(A) of the Act authorizes the Service to issue enhancement of survival permits for listed species. This Agreement is entered into pursuant to the Service’s Safe Harbor Policy and implementing regulations (*Federal Register* 64:32717). It is the intent of the Parties to follow the procedural and substantive requirements of section 10(a)(1)(A) of the Act. Section 10(d) provides that the Service may grant permits authorizing the take of listed species under section 10(a)(1)(A) only if it finds that they “(1) were applied for in good faith, (2) if granted and exercised will not operate to the disadvantage of such endangered species, and (3) will be consistent with the purposes and policy set forth in section 1531 of this Act.” This Agreement satisfies all three conditions

set under section 10(d) of the Act. This Permit has been applied for in good faith. If granted, it is expected to operate to the advantage of the covered species by restoring the available habitat (on PG&E's parcel), by creating opportunities for population recolonization and expansion, by maintaining suitable habitat over the long-term (providing niches for several serpentine endemic species), and by conserving rare populations of species that are endemic to the San Francisco Bay Area and that are declining in response to widespread habitat loss and other factors. This Agreement and Permit are consistent with the purposes and policies of the Act, because they are expected to further the conservation of the covered species in a manner consistent with the recommendations and strategies contained in the *Recovery Plan for the Serpentine Soil Species of the San Francisco Bay Area* (USFWS 1998) (Recovery Plan).

The purpose of this Agreement is for the Parties to collaborate and implement conservation measures for the covered species. This will be accomplished by restoring and maintaining suitable habitat on the enrolled property. Restoration actions will primarily involve controlling invasive non-native grasses. PG&E will receive a Permit that authorizes implementation of the conservation actions and other provisions of this Agreement and authorizes incidental take of the covered species above PG&E's baseline responsibilities, as defined in this Agreement.

3.0 DESCRIPTION OF COVERED SPECIES

3.1 Bay Checkerspot Butterfly

Description

The bay checkerspot butterfly (*Euphydryas editha bayensis*) is a medium-sized member of the brush-footed butterflies, or family Nymphalidae. The wing pattern resembles a checkerboard, with both wings featuring black bands enclosing bright red, yellow, and white spots. The bay checkerspot butterfly is endemic to the greater San Francisco Bay Area and is often associated with serpentine grassland vegetation. This species was federally listed as threatened in 1987 [*Federal Register* 52:35366 (September 18, 1987)]. Approximately 23,903 acres in San Mateo and Santa Clara counties, including Tulare Hill, were designated as critical habitat in 2001 [*Federal Register* 66:21449 (April 30th, 2001)]. A recovery plan for the butterfly and other serpentine endemic species was published by the U.S. Fish and Wildlife Service in 1998. The Recovery Plan indicated that Tulare Hill is essential both as a population center and as a "stepping stone" for butterfly dispersal across the valley (USFWS 1998).

Distribution

This species has been extirpated from portions of its historic range and is no longer detected in Contra Costa, Alameda, or San Francisco Counties. Historically, the bay checkerspot butterfly occurred east, west, and south of San Francisco Bay (south from Twin Peaks in San Francisco, west of Mount Diablo, and north of Hollister). Currently,

the entire species is distributed into five core areas, one in San Mateo County, and the others concentrated on Coyote Ridge (northeast of Tulare Hill) in Santa Clara County. The major Coyote Ridge populations are termed Kirby, Metcalf, San Felipe, and Silver Creek Hills. The four Coyote Ridge populations occur on serpentine soils, with each population separated by unsuitable habitats dominated by exotic grasses (USFWS 1998).

Population Dynamics

The current distribution of the bay checkerspot butterfly is patchy and is thought to function within a metapopulation framework. Metapopulations are interconnected subpopulations characterized by frequent extinction and recolonization events (Hanski 1996). The current San Francisco Bay Area butterfly distribution is divided into two major metapopulations, one in San Mateo County and the other in Santa Clara County. The Santa Clara County metapopulation is considered vital to the long-term persistence of this species (USFWS 1998). Metapopulation ranges are divided into smaller core areas (defined as areas of suitable habitat that support persistent populations), as well as smaller secondary and tertiary habitats (where extinction and recolonization events are more frequent). Precise population boundaries vary annually with the growth cycle and seeding patterns of the butterflies' various sympatric host plants. The Recovery Plan states that "any site with appropriate habitat within the vicinity of the historic range of the bay checkerspot should be considered potentially occupied by the butterfly" (USFWS 1998).

Populations of bay checkerspot butterflies on Tulare Hill vary depending on host plant concentrations, annual rainfall patterns, and habitat availability. Variable population densities from year to year are typical of bay checkerspot butterfly natural history (CH2MHill 2004). Satellite colonies can become established through dispersal in good years, but commonly disappear during adverse conditions (Ehrlich *et al.* 1980). These satellite colonies may contribute to the maintenance of the overall metapopulation, by serving as stepping stones for the re-colonization of distant sites and by augmenting the pool of dispersing butterflies. The Recovery Plan designates Tulare Hill as "a larger, good quality habitat near core populations" and as a "stepping stone" between the Coyote Ridge populations and the more western habitat areas.

Habitat

This species is associated with native grassland species assemblages which now primarily occur on serpentine soils or rock outcroppings where there is minimal competition with the more common, dominant, introduced annual grasses. The primary larval host plant is dwarf plantain (*Plantago erecta*), an annual herb that co-occurs with native grasses. Later in the summer (as the dwarf plantain dries) the larvae may require secondary food sources such as owl's clover (*Castilleja densiflora* or *C. exserta*). Adult butterflies require nectar from native wildflowers that grow in serpentine grasslands including common lomatium (*Lomatium utriculatum*), lace parsnip (*L. dasycarpum*), California goldfields (*Lasthenia californica*), tidy-tips (*Layia platyglossa*), false baby stars

(*Linanthus androsaceus*), muilla (*Muilla maritima*), fiddleneck (*Amsinckia intermedia*), and jeweled onion (*Allium serra*) (USFWS 1998).

Life History

The bay checkerspot butterfly produces a single generation per year. There are four butterfly life stages: egg, larvae (caterpillar), pupa, and adult. Reproduction occurs from late February through early May (Weiss *et al.* 1988). Eggs are deposited near the base of larval host plants such as *Plantago erecta* (Singer 1972). The larvae hatch within 10 days and feed for two weeks or more before entering a summer dormancy period (diapause) that lasts through the dry season (Ehrlich 1965, Singer 1972). During dormancy larvae take refuge under rocks or within cracks in the soil (USFWS 1998). Diapause is broken at the onset of the rainy season. Black larvae will continue feeding on newly germinated dwarf plantain until February or early March (Singer and Ehrlich 1979, Weiss *et al.* 1988). Adults emerge following 10-20 days of pupation and generally live for only 1-2 weeks (Ehrlich 1965, Murphy *et al.* 1983, Cushman *et al.* 1994). Several factors such as sun exposure, topographic aspect, and microclimatic conditions at ground level affect the developmental rates of the butterfly immature stages as well as the seasonal activity period of the adults (Weiss *et al.* 1988, Fleishman *et al.* 2000).

Threats

Two primary reasons for the bay checkerspot's decline are (1) habitat loss (as a result of urban development) and (2) habitat degradation (mainly resulting from non-native displacement of larval host plants and native wildflowers that provide nectar sources for adult butterflies). In addition, drought and other extreme weather fluctuations have been implicated as possible factors in the extirpation of some populations, particularly in areas with livestock overgrazing (Ehrlich *et al.* 1980, Weiss 1996). Habitat loss has not only reduced the total number of bay checkerspot populations, but has also increased the intervening distances between the remaining populations, limiting dispersal and gene flow. Other sources of butterfly mortality include illegal collecting activities and the application of pesticides or herbicides to occupied or unoccupied habitat areas (USFWS 1998).

3.2 Santa Clara Valley dudleya

Description

The Santa Clara Valley dudleya (*Dudleya setchellii*) is a federally threatened perennial succulent within the stonecrop family (Crassulaceae). This low-growing, drought-resistant plant has pale yellow flowers and light grayish-green, fleshy, triangular-shaped leaves that reach a maximum length of 3 inches (USFWS 1998).

Distribution

This species is endemic to south Santa Clara County. The narrow 20-mile distribution extends south from San Jose to San Martin, with most occurrences located in the Coyote Valley area (USFWS 1995). The *Dudleya setchellii* type specimen was collected in 1901 from Tulare Hill by Willis L. Jepson (Jepson 1901). Santa Clara Valley dudleya populations have been consistently located on Tulare Hill. During electrical transmission corridor surveys on the enrolled property in 2005, several rocky outcrops supporting clusters of individual plants were observed (PG&E 2005). In 2004, the Metcalf Energy Center Preserve (directly south of the enrolled property line) roughly estimated the total population size on the neighboring parcel as 6,200 plants (CH2MHILL 2004).

Population Dynamics

Most Santa Clara Valley dudleya populations occur on private lands. Developing detailed management plans for the long-term conservation of multiple serpentine grassland listed species (including *Dudleya setchellii*) is considered a high priority by the Service (USFWS 1998). According to the 1998 USFWS Serpentine Recovery Plan, individual management plans “should include provisions for standardized monitoring of *Dudleya setchellii* populations every 3 years to determine demographic trends”. Individual plants mature slowly and have a life-span of 10 years. In wet years seedling germination can be high, but survival is often very low. At the Kirby Canyon Landfill seedling survival was less than 5% in the first year and under 1% in subsequent seasons (USFWS 1998). The overall population distribution of Santa Clara Valley dudleya is patchy because of the close association with rocky substrates. According to the Service’s online species account, recent surveys in Santa Clara County have located several additional dudleya sites, which has revised the total number of extant occurrences to 50 (USFWS 2005). The entire species population is now estimated at 85,000 plants (USFWS 2005).

Habitat

This species primarily occurs on rocky outcroppings within valley and foothill serpentine grasslands and cismontane woodlands. Each rocky outcrop often supports 30 to 60 plants and higher survival has been documented on east or north-facing slopes (USFWS 1998). Individual plants grow long roots that extend over 6 inches down into rocky serpentine soil crevices (USFWS 1998). Santa Clara County dudleya co-occurs with several serpentine grassland natives including bottlebrush squirreltail (*Elymus elmoides*), California poppy (*Eschscholzia californica*), California goldfields (*Lasthenia californica*), dwarf plantain (*Plantago erecta*), purple needlegrass (*Nassella pulchra*), and tidy-tips (*Layia platyglossa*). This species also co-occurs with several rare California natives including both subspecies of jewelflower (*Streptanthus albidus albidus* and *S. a. peramoenus*), Mt. Hamilton thistle (*Cirsium fontinale campylon*), Tiburon paintbrush (*Castilleja affinis neglecta*), coyote ceanothus (*Ceanothus ferrisiae*), and fragrant fritillary (*Fritillaria liliacea*) (USFWS 1998).

Life History

In the spring (from May through June) each plant produces two or three flowering stems (USFWS 1998) with each flower generating wind-dispersed seeds (McCarten 1993). Vegetative reproduction also occurs by the formation of small rosettes that separate from the parent plant. Individual plants are susceptible to frost (USFWS 1998).

Threats

Development is the primary threat to existing populations. In addition, this species is threatened by “landfill activities, unauthorized dumping, quarry expansion and off-road vehicles” (USFWS 1998). Many past construction projects have negatively impacted several of the larger remaining populations (USFWS 1998). Other sources of mortality include plant collecting (for scientific, commercial, or other purposes) and grazing (USFWS 1998).

3.3 Metcalf Canyon jewelflower

Description

The Metcalf Canyon jewelflower (*Streptanthus albidus albidus*) is a federally endangered annual herb within the mustard family (Brassicaceae). *Streptanthus albidus* is genetically distinct from several closely-related jewelflower species (USFWS 1998). This species is included in the Recovery Plan for the bay checkerspot butterfly and other serpentine endemic species published by the U.S. Fish and Wildlife Service in 1998.

Distribution

The Metcalf Canyon jewelflower is locally abundant but extremely range-limited. Populations are restricted to Santa Clara County and are further limited to small serpentine soil inclusions within valley and foothill grasslands. The entire subspecies distribution extends less than 20 miles (from San Jose to Anderson Reservoir) and is endemic to the Coyote Ridge area. There are several recent records east of Highway 101 and a single historical occurrence listed for Tulare Hill (CNDDDB Occurrence No. 11). The entire historical population on the north side of Tulare Hill was reportedly extirpated by construction debris from a housing development (CH2MHILL 2004).

Population Dynamics

This species is distributed among nine known extant populations supporting approximately 20,000 – 25,000 individual plants (USFWS 1998). Each of the nine populations is genetically distinct. Each population is therefore contributing to the overall genetic variability present within the remaining gene pool (Mayer 1998). The USFWS Serpentine Recovery Plan recommends managing the remaining nine populations by securing large blocks of serpentine habitat, creating 150-meter buffers around existing populations (to allow for population expansion), and minimizing external

threats (USFWS 1998). The plan also recommends re-introduction efforts on Tulare Hill, and assumes that the historical population on the enrolled property has been extirpated without subsequent re-colonization. Surveys conducted on Tulare Hill for bay checkerspot butterfly monitoring from 2001 - 2003 did not identify any jewelflower species (CH2MHILL 2004).

Habitat

Metcalf Canyon jewelflower is endemic to California native grasslands. This species occurs on rocky serpentine outcroppings and has been recorded from road cuts containing serpentine substrates. Rare plants associated with Metcalf Canyon jewelflower include most beautiful jewelflower, Santa Clara Valley dudleya, and Mt. Hamilton thistle (*Cirsium fontinale* var. *campylon*).

Life History

The flowering period is from April through June. There is little information on population demographic trends, dispersal rates, colonization patterns, or pollination (USFWS 1998).

Threats

Development, mining, cattle grazing, off-road vehicular travel, routine road maintenance practices, and general construction are considered to be the primary threats to the remaining populations (USFWS 1998). Other factors that may contribute to declines are competitive exclusion by non-native grasses, increasing habitat fragmentation, and the effect of various vegetation management strategies (grazing, mowing, or burning) on unoccupied and occupied habitat areas.

4.0 DESCRIPTION OF COVERED AREA

PG&E owns approximately 45 acres of property located on Tulare Hill in south Santa Clara County. The PG&E parcel is located southwest of PG&E's Metcalf Substation and borders the Metcalf Energy Center (administered by Calpine) on the southeastern corner. This property is considered the "enrolled property" as defined in the Service's final Safe Harbor Policy. The enrolled property contains a critical power line corridor consisting of five transmission lines which provide bulk transmission power to the South San Francisco Bay Area. The parcel consists of a narrow strip of serpentine grassland measuring 900 feet in width at Monterey Road and approximately 500 feet in width at Santa Teresa Blvd. (Exhibit A).

PG&E's parcel contains 45-acres of serpentine grassland habitat. The property is demarcated on the south by a fence (constructed in 2001) that divides PG&E's property from the Metcalf Energy Center Preserve, a conservation easement established by Calpine to enhance and safeguard habitat for several special-status serpentine endemic species

occurring on Tulare Hill. This preserve is currently managed by the Land Conservancy of Silicon Valley.

PG&E has five sets of transmission towers on Tulare Hill, consisting of 18 structures. There are fourteen steel towers and four wooden poles carrying bulk transmission voltage (115 kV, 230 kV and 500 kV). PG&E relies on existing roads and crossings to access all of its facilities on Tulare Hill. Each tower has an established work area that is utilized for maintenance and operation activities (Exhibit A).

5.0 PROJECT DESCRIPTION

5.1 Description of Grazing Practices

Historical Conditions

Tulare Hill, including PG&E's 45-acre parcel, was historically grazed at the rate of 1 cow/3 acres from the early 1990's until 2001. Prior to 1990, Tulare Hill likely supported year-round cattle grazing supplemented with hay feedings during the driest months. The lack of residual dry matter and extensive areas of bare ground suggest that the historical stocking rate was too high, resulting in overgrazing. Since the summer of 2001, cattle grazing on Tulare Hill has been restricted to the south side of the fence line delineating the Metcalf Energy Center Ecological Preserve. On PG&E's ungrazed parcel, annual non-native grasses have increased restricting the growth of *Plantago erecta* and other serpentine-associated native plants.

Managed Grazing Plans

With the proper frequency and management, cattle grazing may be useful as a tool to curb non-native grasses and enhance bay checkerspot butterfly host plant populations. Managing for larger populations of dwarf plantain (and other essential butterfly host plant species) will safeguard and conserve Tulare Hill bay checkerspot butterfly populations, either by increasing current population sizes, or by providing additional dispersal habitat. On the south side of Tulare Hill, managed cattle grazing is currently the preferred method for suppressing non-native grasses and retaining native plant cover (CH2MHILL 2004).

PG&E will resume cattle grazing on the enrolled property to benefit bay checkerspot butterfly conservation. The historical (pre-2001) grazing practices on Tulare Hill will be modified to improve habitat conditions for native species. Grazing regimes will be somewhat flexible to support adaptive management of butterfly habitat. Cattle grazing will be accomplished by removing a portion of the fencing separating the enrolled property from the preserve parcel. This will allow cattle to access the pastures on the north side of Tulare Hill. Additional grazing restrictions (currently included in the Preserve's Resource Management Plan) involve removing more cattle in the summer and fall to avoid seasonal overgrazing.

Potential Grazing Effects on Rare Plants

Cattle grazing may have direct or indirect impacts on several rare plants that co-occur with the bay checkerspot butterfly in serpentine grasslands. Many of the known populations of Santa Clara Valley dudleya occur in areas with managed cattle grazing. Grazing can cause seedling establishment to fail, may reduce the viability of established plants, or can result in individual dudleya mortality (Freas 1993). Similarly, cattle grazing may contribute to Metcalf Canyon jewelflower population declines. Grazing may interfere with the jewelflower reproductive cycle and individual plants are vulnerable to trampling.

According to the Service's 1998 Serpentine Recovery Plan, the effects of various serpentine grassland management strategies on *Dudleya setchellii* or *Streptanthus albidus* populations have not been evaluated (USFWS 1998). The Serpentine Recovery Plan prioritizes research on the effects of cattle grazing on the Metcalf Canyon Jewelflower and the Santa Clara Valley dudleya in order to aid managers in selecting management strategies that maintain bay checkerspot butterfly habitat while not adversely affecting these two listed plant species. PG&E proposes to fence up to five rocky outcroppings that currently support dudleya plants to prevent grazing the entire enrolled property acreage. This will allow limited comparisons of grazed vs. ungrazed habitat conditions, and if necessary, will address whether the level of cattle grazing is causing a deleterious effect on pre-existing or potential rare plant populations.

5.2 Description of Monitoring Provisions

PG&E will annually monitor the enrolled property for the duration of this Agreement. A single monitoring visit will occur on or about March 31st of each year (weather permitting). Monitoring will consist of photographic plots, timed bay checkerspot post-diapause larval counts, and Santa Clara Valley dudleya assessments. The annual visit is also timed to coincide with the blooming period of the Metcalf Canyon jewelflower.

1. Photographic plots will be established along the southern fence line bordering the preserve property. When the fence is removed, several fenceposts will be left to delineate the southern property boundary. Photographic plots will record annual vegetation characteristics. Plots will be established in areas that have been defined with moderate or cool topoclimates (specifically along the southern property boundary and additionally along the permanent dirt road that traverses Tulare Hill). Core occupied bay checkerspot butterfly areas are located primarily in cool topoclimates (CH2MHILL 2004).
2. Postdiapause larvae are visible during February and March as black caterpillars. Bay checkerspot butterfly populations are commonly monitored by caterpillar surveys. Timed searches (2 person/5 minutes/1000m²) will be conducted in larval monitoring areas previously established on the enrolled property by CH2MHILL.

3. Adult bay checkerspot butterflies encountered during the annual monitoring visits will be tallied and recorded. Adult presence may represent dispersal from adjacent properties.
4. Fenced serpentine rocky outcroppings will be monitored for Santa Clara Valley dudleya. Dudleya plants located within fenced enclosures will be counted and photographed. This species will also be monitored on paired grazed (unfenced) serpentine outcrops. Size classes, the number of inflorescences, and any evidence of grazing on individual plants will be recorded and compared among the grazed and ungrazed locations.
5. Fenced enclosures and unfenced rocky substrates will also be surveyed for jewelflower. Any Metcalf Canyon jewelflowers encountered during annual monitoring visits will be recorded.

5.3 Description of Reporting Provisions

An annual monitoring report will be prepared and submitted to the Service for each year that this Agreement remains in effect. The report will be submitted by November 1st of each year and will detail the following information:

- Photograph plots.
- Bay checkerspot butterfly larval counts.
- Bay checkerspot butterfly adults noted.
- Santa Clara Valley dudleya counts and comparisons between grazed and ungrazed plots.
- Metcalf Canyon jewelflower noted.

If both PG&E and the Service agree to terminate this Agreement, a final report will be submitted within 90 days of permit termination.

5.4 Covered Activities

“Covered activities” under this Agreement include any otherwise lawful activities within the enrolled property that have been restored or enhanced pursuant to this Agreement. “Covered activities” shall include Incidental take of the bay checkerspot butterfly and other special-status species that could occur as a result of a variety of routine PG&E activities. For example, PG&E’s normal utility operations and property management activities on Tulare Hill include, but are not limited to, the following:

- Managing cattle grazing on the property to control the growth of non-native grasses;
- Constructing fencing to limit the areas of cattle grazing;
- Maintaining access to transmission towers by existing dirt access roads and stream crossings; and maintaining access to work pads at the base of each tower;

- Conducting ground patrols of transmission lines and associated facilities using either light trucks or all-terrain vehicles on existing access roads;
- Inspecting tower footings and poles to verify stability, structural integrity, and equipment condition;
- Washing of electrical insulators to prevent faulting using distilled water or ground corn cobs;
- Conducting outage repair activities to maintain public safety as required by the CPUC;
- Reconductoring electrical lines using a truck- or trailer-mounted bull-wheel puller, a small truck- or trailer-mounted crane, and rewinders with collapsible reels to pull conductors through travelers;
- Replacing, repairing or upgrading electrical system towers (including telecommunication attachments); and
- Replacing, repairing or upgrading electrical system poles and equipment (e.g., cross arms, insulators, pins, transformers, wires, cables, guys, anchors, switches, fuses, or paint).

These operational activities are described in more detail in the summary entitled, “PG&E Work Activities on Tulare Hill” attached hereto as **Exhibit B** and incorporated herein by reference.

In addition, if the bay checkerspot butterfly population expands during the term of this Agreement or if there are significant range adjustments, incidental take of adults or larvae may be more likely to occur during routine activities in sensitive areas. If PG&E proposes to undertake any actions that fall outside the scope of habitat management and enhancement or its normal utility operations and property management activities, and if PG&E reasonably expects that activities will result in the incident take of any covered species (including any activities that will return the property to baseline conditions) PG&E shall give the Service at least 30 days advance notice thereof and PG&E and the Service will work cooperatively to minimize negative impacts to the bay checkerspot butterfly from any such actions.

5.6 Funding Provisions

PG&E owns the enrolled property and is committed to implementing the provisions of the Agreement and Permit. Implementation of this Agreement is subject to the requirements of the Anti-Deficiency Act and the availability of appropriated funds. Nothing in this Agreement will be construed by the Parties to require the obligation, appropriation, or expenditure of any funds from the U.S. Treasury. The Parties acknowledge that the Service will not be required under this Agreement to expend any Federal agency’s appropriated funds unless and until an authorized agency official affirmatively acts to commit to such expenditures as evidenced in writing.

6.0 DESCRIPTION OF BASELINE CONDITIONS

Tulare Hill is underlain by serpentine soils with occasional serpentine rock outcrops. In areas with shallow surface serpentine soils, the grassland is characterized by a relatively open cover with an increased number of native species, including perennial bunchgrasses. Competing introduced grasses common to these areas include wild oats (*Avena fatua*) and Italian ryegrass (*Lolium multiflorum*). Native species such as purple needlegrass (*Nasella pulchra*), cream cups (*Platystemon californicus*), goldfields (*Lasthenia californica*), California poppy (*Eschscholzia californica*), dwarf plantain (*Plantago erecta*), smooth lessingia (*Lessingia micradenia* var. *glabrata*), and star tulip (*Calochortus venustus*) have historically flourished on Tulare Hill.

PG&E's normal utility maintenance and property management activities on Tulare Hill are unlikely to cause reductions of the covered species below baseline conditions. Many of PG&E's routine maintenance procedures or temporary ground disturbing activities have the potential to enhance bay checkerspot butterfly habitat over the long run as they provide disturbed areas with lower competition from native grasses. Fencing a portion of the serpentine rocky outcroppings that support Santa Clara Valley dudleya would maintain baseline conditions for this species as well. Baseline conditions will be maintained by adequately monitoring grazing on the enrolled property (See section 5.2, Description of Monitoring Practices). Should the baseline conditions for the covered species fall below the baseline levels, PG&E will re-evaluate its activities on the enrolled property (including the grazing management plan) and will contact the Service to consult and determine an appropriate course of action.

6.1 Setting Baseline Levels

The Service's Final Safe Harbor Policy requires a complete description of baseline conditions for all covered species identified in this Agreement [*Federal Register* 64:32717(June 17, 1999)]. Baseline levels can be described by population estimates, locations of individual animals, the amount of habitat available, or by site characteristics that contribute to occupancy. Often baseline levels are described in terms of the amount and condition of available habitat (and not in terms of population census) because the number of individuals present in a given area is expected to fluctuate over time. PG&E will set baseline levels primarily based on site characteristics and not on population census measurements. Baseline conditions are only set at zero when there is no seasonal or permanent occupation by the covered species.

6.2 Baseline for Bay Checkerspot Butterfly

PG&E proposes to set the baseline level for the covered wildlife species (the bay checkerspot butterfly) with two measures. The first will be simply whether the property is grazed or not grazed, as grazing is recognized as an effective management tool for serpentine grasslands (USFWS 1998). The second will be based on a 2006 vegetation cover assessment of the enrolled property. Because of inherent variation in the annual occupancy rates and structure of the bay checkerspot butterfly metapopulation, baseline conditions may be best described in terms of available habitat. Butterfly habitat can be characterized by relative host plant abundance (*Plantago erecta* and *Castilleja* species)

and the amount of available nectar sources (*Lasthenia californica*, *Layia platyglossa*, and *Lomatium* species). For many reasons, single-year baseline assessments are poor estimations of long-term habitat conditions on the enrolled property. Seasonal densities of the native annual plant populations are naturally dynamic and can seasonally expand or contract depending on multiple extrinsic factors (such as annual rainfall, temperature, soil composition, etc.). Similarly, bay checkerspot butterfly populations are limited by multiple factors that vary annually (such as host plant abundance) that can result in significant year-to-year population changes. Although this natural population variability suggests that the baseline level for the enrolled property would be best described in terms of long-term annual monitoring data (i.e. several years of vegetation cover measurements at the same grazing level), long-term annual monitoring data is not available.

PG&E has conducted a quantitative vegetation assessment to measure baseline habitat conditions on the enrolled property. Eight vegetation cover categories were defined including % dwarf plantain (*Plantago erecta*), % owl's clover (*Castilleja* sp.), % cream cups (*Platystemon californicus*), % nectar sources (*Lasthenia californica*, *Lomatium* spp., and *Layia platyglossa*), % exotic grasses, % all other plant species, % bare ground, and % rock. This vegetation assessment was analyzed to provide cover estimates of host plant populations and nectar sources present in 2006. Results of this assessment are available in Exhibit C.. PG&E's parcel contains 45-acres of serpentine grassland habitat. Because of the recent expansion of non-native grasses, only a small portion of this acreage is currently suitable for larval-stage bay checkerspot butterfly occupancy. Conditions on PG&E's Tulare Hill parcel have rapidly deteriorated in the absence of appropriate management strategies for the bay checkerspot butterfly. In general, baseline conditions are defined at a level provided by the 2006 data and specifically are designated by vegetative cover estimates that relate specifically to the life history of the bay checkerspot butterfly (10.3% dwarf plantain, 0.1% owl's clover, and 3.2% nectar sources) (**Exhibit C**).

6.3 Baseline for Covered Plant Species

Take prohibitions do not apply to listed plants located on private property [*Federal Register* 64:32717 (June 17, 1999)]. However, the Service "strongly encourages" private property owners to consider and include listed plants within Safe Harbor Agreements and to "voluntarily assist the Service in restoring or enhancing listed plant habitats present within the enrolled property" (*Federal Register* 64:32717). PG&E has included two federally-listed plants within this Agreement as covered species. Both of the federally-listed species have historically occurred on Tulare Hill.

Metcalf Canyon jewelflower

The Metcalf Canyon jewelflower may be extirpated from the enrolled property. Although focused spring surveys for jewelflowers have not occurred on PG&E's Tulare Hill parcel, this species was not encountered on Tulare Hill during bay checkerspot butterfly monitoring from 2001 – 2003 (CH2MHILL 2004), during baseline surveys in 2006

(Exhibit C), or during limited botanical surveys conducted in 2007 around several tower footings (Weiss 2006). Baseline levels for the Metcalf Canyon jewelflower will be set at zero because there are no recent records of this species on Tulare Hill.

Santa Clara Valley dudleya

A large population of Santa Clara Valley dudleya is present on Tulare Hill. Several dudleya plant clusters were recently identified on the enrolled property during 2005 surveys of the electrical transmission corridor (PG&E 2005). In 2002, sixteen 500-foot transects distributed among east-facing slopes, west-facing slopes, and ridge-tops, [revealed a total of 78 locations of *Dudleya setchellii* within PG&E's 45-acre parcel. Baseline conditions for the Santa Clara Valley dudleya are defined at the number of recorded individual occurrences (no more than 1000 individuals distributed over a minimum of 78 serpentine outcrops).

7.0 NET CONSERVATION BENEFIT

PG&E, along with its adjoining property owners, intends to restore, enhance, and safeguard the native serpentine grasslands which occur naturally on Tulare Hill by implementing specific conservation measures. These measures are reasonably expected to be beneficial for the conservation of several regional and locally occurring special-status serpentine endemic species. PG&E intends to further this goal by working with the Land Conservancy of Silicon Valley to develop an adaptive grazing management plan to assist in the reduction of invasive exotic grasses by resuming cattle grazing on PG&E's Tulare Hill parcel. This grazing regime will support either (1) existing populations of larval or adult butterflies, or (2) re-colonization of recently extirpated areas. The Land Conservancy of Silicon Valley will properly manage cattle grazing to retard and control the growth of non-native grasses which compete with native species including the bay checkerspot butterfly's primary larval host plant, *Plantago erecta*. Management activities will involve fencing improvements that will allow cattle stocked on the Land Conservancy of Silicon Valley property to the south to extend their grazing range north to PG&E's property and the remainder of Tulare Hill.

This conservation measure is reasonably expected to result in the following Net Conservation Benefits to the covered wildlife species:

- Increased availability of suitable breeding and foraging habitat through control of non-native grasses;
- Greater likelihood of increased population sizes of the bay checkerspot butterfly in the general area;
- Maintenance of a viable dispersal corridor across Tulare Hill;
- Potential conservation of genetic diversity for the Santa Clara Valley bay checkerspot butterfly metapopulation;
- Minimization of the potential for bay checkerspot butterfly extirpation in the general area.

The adjacent Metcalf Energy Center Ecological Preserve is annually monitored and supports adaptive management strategies for vegetation restoration (CH2MHILL 2004). Under this Agreement, the grazing strategy currently implemented on Metcalf Energy Center Ecological Preserve will be extended onto the enrolled property. Removal of the fence line will enable the native serpentine grassland recovery on PG&E's parcel in a manner compatible with the preserve's land parcel. After the initial year of restricted grazing on the preserve, the native vegetation diversity increased the following season (CH2MHILL 2004). Resuming a carefully managed grazing regime is likely to increase habitat suitability and availability for the bay checkerspot butterfly (by restoring native vegetation) which would be expected to result in a positive population response.

The Service has determined that PG&E's conservation measures, as described in this Agreement, will be reasonably expected to provide the net conservation benefits listed above for the bay checkerspot butterfly. The Service has also determined that the duration of the Agreement and associated Permit will be reasonably expected to be sufficient to achieve these net conservation benefits.

In addition, the Agreement supports recovery objectives listed in the *Recovery Plan for Serpentine Soil Species of the San Francisco Bay Area* (Recovery Plan). The Recovery Plan states that conserving Tulare Hill is essential to the bay checkerspot butterfly. The Agreement will not result in protection in perpetuity, but will provide for proper grazing management to benefit the native host plants for this species for the duration of the Agreement. The Recovery Plan also prioritizes research on the effects of cattle grazing on the Metcalf Canyon Jewelflower and the Santa Clara Valley dudleya to aid managers in selecting management strategies that maintain bay checkerspot butterfly habitat while not adversely affecting these two listed plant species. PG&E has proposed a monitoring program that will provide information to this effect.

8.0 OTHER LAND OWNERS WHO MAY SECURE INCIDENTAL TAKE AUTHORIZATION

It is acknowledged that other neighboring landowners currently may be undertaking conservation management activities on Tulare Hill in accordance with other permits or authorizations. Other landowners are not Parties to this Agreement or the Permit associated with this Agreement. If PG&E's voluntary conservation measures result in new or expanded occupation of adjacent properties by the covered species, the Service will use the maximum flexibility allowed under the Act to address neighboring properties under the Agreement and the associated Permit, or such other authorization that otherwise governs the neighboring landowner's activities. Moreover, the implications to neighboring landowners and the potential need to actively address these implications will be determined on a case-by-case basis. In general, the Service will endeavor to include neighboring landowners whose activities may affect listed species as a Party to this or to a separate Agreement and permit.

9.0 RESPONSIBILITIES OF THE PARTIES

9.1 Landowner Responsibilities

Subject to the express terms and conditions of this Agreement (including without limitation this Section 6.1), PG&E agrees to implement the grazing management actions and other provisions of this Agreement, to adhere to the terms and conditions of the Permit, and to provide sufficient funding and other resources necessary to implement the Agreement during the term of this Agreement. With reasonable advance notice, PG&E shall allow Service personnel, or other properly permitted and qualified persons designated by the Service, to enter the enrolled property at reasonable hours and times to inspect the enrolled property to insure compliance with this Agreement.

Notwithstanding anything contained in this Agreement, the Service and PG&E acknowledge and agree that any third party use of PG&E's property related to or otherwise arising out of the implementation of the terms and provisions of this Agreement shall be subject to (i) a separate written agreement between PG&E and such third party in form and substance satisfactory to PG&E in its sole and absolute discretion and (ii) prior receipt of final, unappealable and unconditional approval from the California Public Utilities Commission ("CPUC") if such approval is deemed necessary or desirable as determined by PG&E in its sole and absolute discretion. Without limiting the generality of the foregoing, the Service and PG&E further agree that the foregoing conditions are applicable to any grazing or other third party use agreed to or permitted on the enrolled property under this Agreement.

9.2 Service Responsibilities

The Service will endeavor to provide technical assistance and funding, if requested and available, to PG&E to assist with implementation of the Agreement. The Service will ensure that PG&E implements the Agreement properly.

9.3 Shared Responsibilities of the Parties

The Parties will ensure that the Agreement and the actions covered in the Agreement are consistent with applicable Federal, State, and Tribal laws and regulations. The Parties will ensure that the terms of the Agreement will not be in conflict with any ongoing conservation or recovery programs for the covered species. Nothing in this Agreement will be construed to limit or constrain any Party or any other entity from taking additional actions at its own expense to protect or conserve the covered species. Nothing in this Agreement will limit the ability of Federal and State conservation authorities to perform their lawful duties, and conduct investigations as authorized by statute and by court guidance and direction. Each party will have all remedies otherwise available to enforce the terms of the Agreement and the Permit, except that no Party shall be liable in damages for any breach of this Agreement, any performance or failure to perform an obligation under this Agreement, or any other cause of action arising from this Agreement. The

Parties agree to work together in good faith to resolve any disputes, using dispute resolution procedures agreed upon by all Parties.

10.0 LAND OWNER ASSURANCES

Through this Agreement, the Service provides PG&E assurances that it may use, alter, or modify the enrolled property, even if such use, alteration, or modification results in the incidental take of the covered species to such an extent that the take returns the covered species to the originally agreed upon baseline conditions. Specifically, the Service provides PG&E assurances that such use, alteration, or modification activities may include, but are not limited to, those activities identified in Section 4.2 and **Exhibit B**. The Service and PG&E agree that PG&E retains the ability to obtain mitigation credits for its non-operational properties on Tulare Hill.

These assurances depend on PG&E complying with the obligations in this Agreement and in the Permit. Further, such assurances apply only to this Agreement, only if the Agreement is being properly implemented, and only with respect to species covered by the Agreement and Permit. The Service has determined that the incidental take of covered species authorized by this Agreement and its accompanying permit will not appreciably reduce the likelihood of survival and recovery in the wild of the covered species.

11.0 AGREEMENT/PERMIT MANAGEMENT

11.1 Agreement / Permit Duration

The parties acknowledge and agree that PG&E currently is preparing a Habitat Conservation Plan (“HCP”) for operations and maintenance activities conducted in PG&E’s Bay Area service territory (“Bay Area HCP”). The HCP will serve as the biological framework to obtain a 30-year Section 10 (a)(1)(B) Incidental Take Permit. This Safe Harbor Agreement will remain in effect for five years. PG&E will have the option to include Tulare Hill in PG&E’s Bay Area HCP after it has been approved by the Service.

11.2 Agreement/Permit Termination

PG&E can terminate this Agreement at any time, for any reason or no reason by providing the Service with 30 days written notice. However, PG&E acknowledges that early termination of the Agreement will result in a corresponding termination of the Permit and PG&E’s loss of the regulatory assurances provided by the Permit for the covered species. PG&E may, however, prior to terminating the Agreement, return the enrolled property to baseline conditions, even if the expected net conservation benefits have not been realized.

11.3 Agreement Renewal and Permit Extension

The Agreement can be renewed with or without modification with the approval of all Parties. If the Agreement is renewed, the corresponding Permit duration will be extended beyond the duration of the Agreement. The duration of the renewed Agreement and Permit will be agreed upon by the Parties.

11.4 Agreement Amendments

Amendments to this Agreement can be proposed by any Party to the Agreement and must be provided to the other Parties in writing. All Parties will have at least 60 days to evaluate proposed amendments, and all amendments must be approved in writing by each Party.

11.5 Transfer of Agreement/Permit Benefits

By signature of this Agreement, PG&E agrees to notify the Service in writing and at least 30 days in advance if all or a portion of its interest in the enrolled property is to be transferred to another owner. If PG&E transfers its interest in all or part of the enrolled property, the Service will regard the transferee as having the same rights and obligations as PG&E under this Agreement, if the transferee agrees to become a party to the original Agreement. Actions taken by the transferee that result in the take of covered species would be authorized if the transferee maintains the terms and conditions of the original Agreement and the Permit. If the transferee does not become a Party to the Agreement, it would neither incur responsibilities under the Agreement nor receive any assurances relative to the Act's section 9 prohibitions that might result from the transferee's actions. After any notification of a transfer of interest in the enrolled property, the Service will contact the proposed transferee to explain the original Agreement and to determine whether the transferee desires to become a Party to the original Agreement or enter a new safe harbor agreement. Notwithstanding anything contained in this Agreement, this Agreement is not intended to run with the land and any transferee or successor owner of the enrolled property or an interest therein shall not be obligated to be a party to the original Agreement or any other agreement with the Service. In the event a transferee becomes a Party to the original Agreement, the Service will honor the terms and conditions of the original Agreement and Permit.

12.0 MODIFICATIONS

A. Modification of the Agreement. Either Party may propose amendments to this Agreement, as provided in 50 CFR 13.23, by providing written notice to, and obtaining the written concurrence of, the other Party. Such notice shall include a statement of the proposed modification, the reason for it, and its expected results. The Parties will use their best efforts to respond to proposed modifications within 60 days of receipt of such notice. Proposed modifications will become effective upon the other Parties' written concurrence.

B. Termination of the Agreement. As provided for in Part 12 of the Service's Safe Harbor Policy (FR 64:32717), PG&E may terminate the Agreement for circumstances

beyond their control by giving written notice to the Service. In such circumstances, PG&E may return the Enrolled Property to baseline conditions even if the management activities identified in the Agreement have not been fully implemented.

C. **Permit Suspension or Revocation.** The Service may suspend or revoke the permit for a reasonable cause, in accordance with the laws and regulations in force at the time of such suspension or revocation. PG&E has the right to appeal any suspension or revocation to a mutually agreed upon arbitrator.

D. **Baseline Adjustment.** The baseline conditions for the Enrolled Property may, by mutual agreement of the Parties, be adjusted if, during the term of the Agreement for reasons beyond the control of PG&E, the amount of Covered Species habitat is reduced from what it was at the time the Agreement is signed.

E. Adaptive management allows for mutually agreed-to changes to the management activities in response to changing conditions or new information. This approach will be utilized if needed to assure that the project will provide a net conservation benefit for the Covered Species for the duration of the Agreement. Decisions related to adaptive management will be based on the monitoring results and other information in annual reports.

13. OTHER MEASURES

A. **Remedies.** Each party shall have all remedies otherwise available to enforce the terms of the Agreement and the permit, except that no party shall be liable in damages for any breach of this Agreement, any performance or failure to perform an obligation under this Agreement or any other cause of action arising from this Agreement.

B. **Dispute Resolution.** The Parties recognize that disputes concerning implementation of, compliance with, or termination of, this Agreement may arise from time to time. The Parties agree to work together in good faith to resolve any disputes, using dispute resolution procedures agreed upon by all Parties.

C. **Availability of Funds.** Implementation of this Agreement by the Service is subject to the requirements of the Anti-Deficiency Act and the availability of appropriated funds. Nothing in this Agreement will be construed by the Parties to require the obligation, appropriation, or expenditure of any funds from the U.S. Treasury. The Parties acknowledge that the Service will not be required under this Agreement to expend any Federal agency's appropriated funds unless and until an authorized official of that agency affirmatively acts to commit to such expenditures as evidenced in writing.

D. **No Third-Party Beneficiaries.** This Agreement does not create any new right or interest in any member of the public as a third-party beneficiary, nor shall it authorize anyone not a party to this Agreement to maintain a suit for personal injuries or damages pursuant to the provisions of this Agreement. The duties, obligations, and responsibilities

of the Parties to this Agreement with respect to third parties shall remain as imposed under existing law.

E. Other Listed Species, Candidate Species, and Species of Concern. The possibility exists that other listed, proposed, or candidate species, or species of concern may occur in the future on the enrolled property as a direct result of the management actions specified in this Agreement. If that occurs and the Applicant so requests, the Parties may agree to amend the Agreement and associated permit to cover additional species and to establish appropriate baseline conditions for such other species.

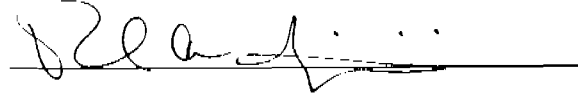
F. Notices and Reports. Any notices and reports, including monitoring and annual reports, required by this Agreement shall be delivered to the persons listed below, as appropriate:

Safe Harbor Program
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, CA 95825

I. Emergency Situations. Emergency situations, such as wildfires, epidemic disease, or other factors, may require utility or property management actions not specified in this Agreement. In these situations, the Parties acknowledge that it may be impossible to provide the 30-day advance notice required by the Agreement prior to initiating activities that could result in the take of covered species. However, PG&E will notify the Service as soon as reasonably possible after discovering such a situation, and will make reasonable accommodations to the Service prior to the emergency management actions. The Parties acknowledge that relocation efforts of affected covered species may be precluded by certain emergency situations. PG&E and the Service will work cooperatively to avoid impacts to covered species resulting from an emergency situation.

By our signatures below, each Party agrees to abide by and uphold the provisions of this Agreement and any conditions of the Permit associated with this Agreement.

Date: 10 April, 2008



Richard A. Gigliotti
Manager, Land Energy Delivery
Technical & Land Services

2008 Craig C. Mondt
Field Supervisor
Sacramento Field Office
U.S. Fish and Wildlife Service

April 10, 2008

Date

Literature Cited

- California Native Plant Society (CNPS). 2005. *Inventory of rare and endangered plants* (online edition, v6-05d). California Native Plant Society, Sacramento, CA.
<http://www.cnps.org/inventory>
- CH2MHILL. 2004. *Annual monitoring report for the Metcalf Energy Center Ecological Preserve*. Unpublished report prepared for the Land Trust for Santa Clara County, March.
- Cushman, J.H., C.L. Boggs, S.B. Weiss, D.D. Murphy, A.W. Harvey, and P.R. Ehrlich. 1994. Estimating female reproductive success of a threatened butterfly: influence of emergence time and hostplant phenology. *Oecologia* 99: 194-200.
- Ehrlich, P.R. 1965. The population biology of the butterfly, *Euphydryas editha*. II. The structure of the Jasper Ridge colony. *Evolution* 19: 327-336.
- Ehrlich, P.R., D.D. Murphy, M.C. Singer, C.B. Sherwood, R.R. White, and I.L. Brown. 1980. Extinction, reduction, stability and increase: the response of checkerspot butterfly (*Euphydryas*) populations to the California drought. *Oecologia* 46:101-105.
- Fleishman, E. A.E. Launer, S.B. Weiss, J.M. Reed, C.L. Boggs, D.D. Murphy, and P.R. Ehrlich. 2000. Effects of microclimate and oviposition timing on prediapause larval survival of the bay checkerspot butterfly, *Euphydryas editha bayensis* (Lepidoptera: Nymphalidae). *Journal of Research on the Lepidoptera* 36: 31-44.
- Freas, K. 1993. Letter to Field Supervisor, U.S. Fish and Wildlife Service, Sacramento, CA. 2 pp.
- Hanski, Ilkka. 1996. *Metapopulation ecology*. In: Population dynamics in ecological space and time. Editors: O.E. Rhodes, R.K. Chesser, and M.H. Smith, University of Chicago Press, Chicago.
- Jepson, W.L. 1901. *Flora of western middle California*. Encina Publishing Company, Berkeley, California. 625 pp.
- Mayer, M. 1998. Letter to Wayne White, U.S. Fish and Wildlife Service, Sacramento, CA. 1 p.
- McCarten, N.F. 1993. Petition to the State of California Fish and Game Commission: *Dudleya setchellii*.

- Murphy, D.D., A.E. Launder, and P.R. Ehrlich. 1983. The role of adult feeding in egg production and population dynamics of the checkerspot butterfly *Euphydryas editha*. *Oecologia* 56: 257-263.
- Pacific Gas and Electric Company. 2005. Low effect habitat conservation plan for the bay checkerspot butterfly for the Metcalf-El Patio 115 kV reconductor and the Metcalf-Hicks/Vasona 230 kV reconductor in Santa Clara County, California. Draft Low-effect Habitat Conservation Plan. 40 pp.
- Singer, M.C. 1972. Complex components of habitat suitability within a butterfly colony. *Science* 176: 75-77.
- Singer, M.C. and P.R. Ehrlich. 1979. Population dynamics of the checkerspot butterfly *Euphydryas editha*. *Fortschritte der Zoologie* 25: 53-60.
- U.S. Fish and Wildlife Service (USFWS). 1987. Endangered and threatened wildlife and plants; determination of threatened status for the bay checkerspot butterfly (*Euphydryas editha bayensis*). *Federal Register* 52: 35366-35378.
- USFWS. 1995. Endangered and threatened wildlife and plants; determination of endangered status for ten plants and threatened status for two plants from serpentine habitats in the San Francisco Bay Area region of California. *Federal Register* 60: 6671-6685.
- USFWS. 1998. Recovery plan for serpentine soil species of the San Francisco Bay Area. Portland, Oregon. 330 + pp.
- USFWS. 1999. Announcement of final safe harbor policy. *Federal Register* 64: 32717-32726.
- USFWS. 2001. Endangered and threatened wildlife and plants; final determination of critical habitat for the bay checkerspot butterfly (*Euphydryas editha bayensis*). *Federal Register* 66: 21449-21489.
- USFWS. 2004. Safe harbor agreements and candidate conservation agreements with assurances; revisions to regulations. *Federal Register* 69: 24084-24094.
- USFWS. 2005. Sacramento Fish and Wildlife Office Species Account for Santa Clara County Dudleya (*Dudleya setchellii*). Endangered Species Division, Sacramento, California.
http://www.fws.gov/sacramento/es/plant_spp_accts/santa_clara_valley_dudleya.htm
- Weiss, S.B., D.D. Murphy, and R.R. White. 1988. Sun, slope, and butterflies: topographic determinants of habitat quality for *Euphydryas editha*. *Ecology* 69:1486-1496.

Weiss, S.B. 1996. *Weather, landscape structure, and the population ecology of a threatened butterfly, Euphydryas editha bayensis*. Ph.D. dissertation. Stanford University. Stanford, California. 119 pp.

Weiss, S.B. 2006. PG&E Safe Harbor Baseline Study on Tulare Hill. Prepared for Pacific Gas and Electric Company. July 2006.

Exhibits

Exhibit A Map of Tulare Hill, Santa Clara County, California

Exhibit B List of PG&E Work Activities on Tulare Hill

Exhibit C Baseline Assessment for Serpentine Endemic Species Located on Tulare Hill in Santa Clara County, California