
E-2: Line 406 Rare Plant Survey

Rare Plant Survey, PG&E Line 406 Project in Yolo County, California

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Introduction

This project is one of several new local gas transmission pipeline projects forecasted in PG&E's long-range investment plans for the local gas transmission system. Connection of PG&E's Line 400/401, located at the base of the Capay Hills in Yolo County to Line 172A in the town of Yolo, will increase the capacity of their local gas transmission system (Figure 1). PG&E's ten-year investment plan for the local transmission system includes the construction of a new pipeline from Line 172A in the town of Yolo east to Line 123 in Roseville some time after 2010.

The proposed project (Line 406) consists of approximately 14 miles of a 30-inch diameter gas transmission pipeline. In addition to the main pipeline, additional support structures for the pipeline will be required. Main line and bridge valves and blow-off stacks will be installed at Line 400/401 and an above ground and fenced pressure limiting and metering station at Line 172A will be constructed. Other pipeline appurtenances include above ground line-markers, electrolysis test stations (ETS), and possibly a mainline valve with an above ground handwheel operator. The proposed in-service date is September 1, 2009 with the start of construction projected to be May 1, 2008.

Line 400/401 is located at the base of the Capay Hills approximately 1.7 miles north of the town of Capay near County Road 85 and runs in a north to south direction along the eastern edge of the Hills. Line 172A is located east of 400/401 and travels northwest to southeast nearly parallel and adjacent with the east side of Interstate 5. The proposed pipeline would travel in an east to west direction connecting the two lines. Starting approximately 1.7 miles north of the town of Capay, the pipeline would tie in to Line 400/401, and cross close to 0.6 miles of orchards, 8 miles of agriculture land, and 5.5 miles of open rangeland in the Dunnigan Hills, before connecting to Line 172A. Construction of the pipeline would temporarily disturb an approximate 40-foot-wide path along the 14-mile stretch of the alignment.

This memorandum provides the results of a special-status plant species survey conducted in spring of 2007 along the proposed route and including a 500 foot buffer, between line 400/401 and line 172A. Survey methods employed and results of the surveys are presented in the following sections.

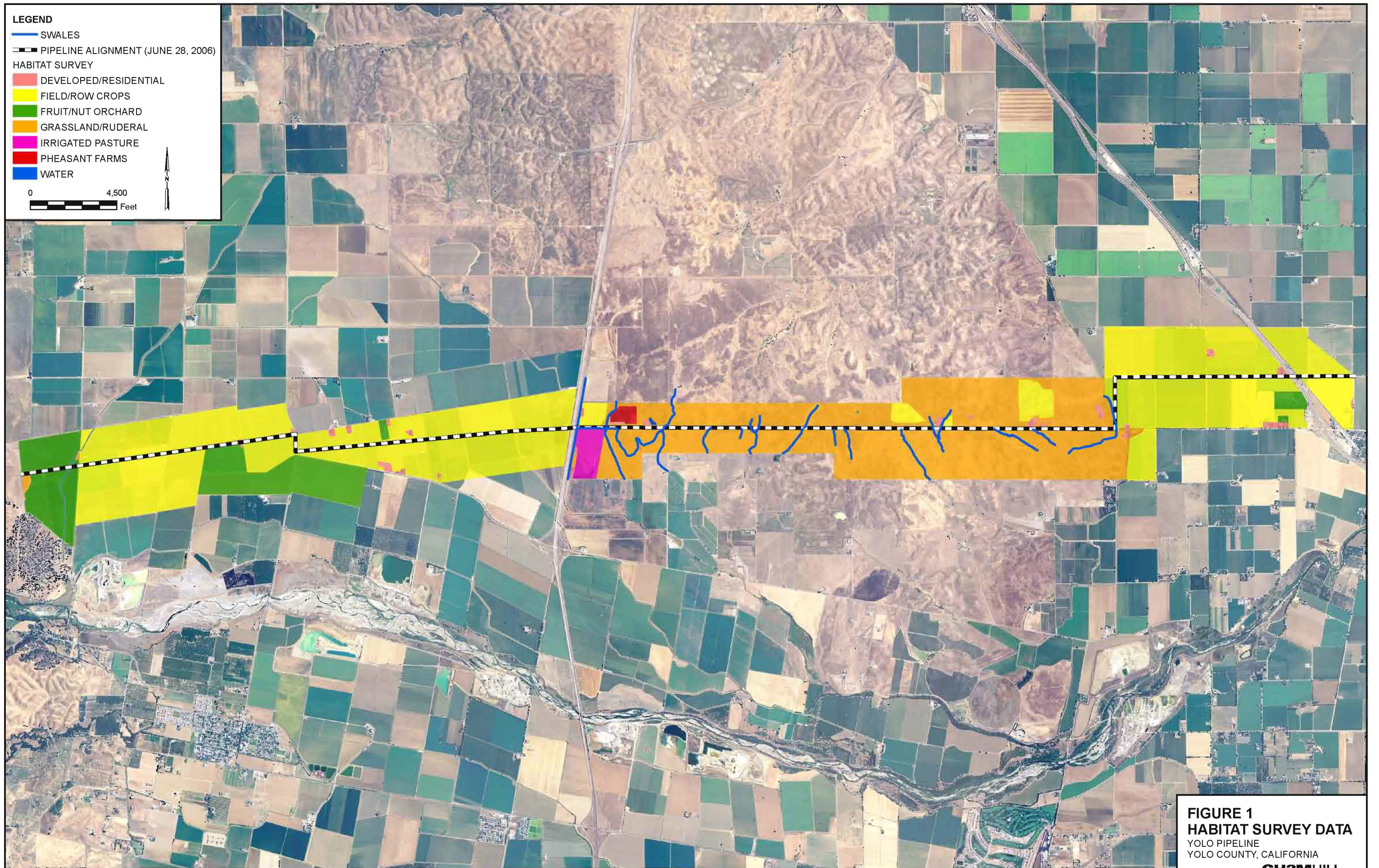
Survey Methods

Rare plant surveys of the project area were conducted by Andy Mieske of Garcia and Associates and Tim Armstrong of CH2M HILL on May 31, 2007 and June 1, 2007. The objective of these surveys was to determine if any special-status plant species occur in the project area. The rare plant surveys were floristic in nature (each plant encountered onsite was identified to the level necessary to ascertain if it was a special-status species). Surveys followed California Department of Fish and Game (CDFG), California Native Plant Society (CNPS), and U.S. Fish and Wildlife Service (USFWS) rare plant survey guidelines (CDFG, 2000; CNPS, 2006; USFWS, 1996).

Prior to field surveys, a target species list was prepared by searching the California Natural Diversity Data Base (CNDDDB), the CNPS Electronic Inventory, and the USFWS Species Lists to identify the special-status plants that occur within the project vicinity (CDFG, 2007; CNPS 2007, USFWS, 2007). The following USGS 7.5' Quadrangle maps were searched for records of special-status plants: Madison, Zamora, Eldorado Bend, Esparto, Monticello Dam, Bird Valley, Woodland, Winters, and Merritt. Federal and state species listed as Threatened, Endangered, or Candidate species were not reported to occur in the 9-quad search. Six species listed by the CNPS as "1B - Rare, Threatened, or Endangered in California and Elsewhere" are known to occur in the 9 quads. One species, woolly-headed lessingia (*Lessingia hololeuca*), is a "List 3 - A Review List Species." The results of the literature and data base searches are found in Appendix A. Special-status plant species, federal and state status, and bloom period are listed in Table 1.

TABLE 1. SPECIAL-STATUS PLANT SPECIES
PG&E Line 406 Project, Yolo County, California

Species	Federal Status	State Status	CNPS Status	Bloom Period
<i>Atriplex cordulata</i> heartscale	None	None	1B	April –October
<i>Erodium macrophyllum</i> round-leaved filaree	None	None	1B	March - May
<i>Fritillaria pluriflora</i> adobe lily	None	None	1B	February - April
<i>Hesperolinon breweri</i> Brewer's western flax	None	None	1B	May - July
<i>Lepidium latipes</i> var. <i>heckardii</i> Heckard's pepper grass	None	None	1B	March - May
<i>Lessingia hololeuca</i> woolly-headed lessingia	None	None	List 3	June - October
<i>Navarretia leucocephala</i> ssp. <i>Bakeri</i> Baker's navarretia	None	None	1B	April - July



Documented occurrences for each species were reviewed from the CNDDDB, and field identification was aided by different phenological stages in photographs from CalPhotos: Plants (CalPhotos: Plants, 2007). Developed agricultural fields account for approximately 8.5 miles of the proposed alignment. Consistent with the USFWS *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants* (USFWS, 1996), developed agricultural fields were not surveyed on foot. “Windshield surveys” were utilized in agriculture areas to ensure potential habitat or natural vegetation communities were no longer present. The 5.5-mile stretch of alignment bound by County Road 17, County Road 95A, and a 500-foot buffer was surveyed on foot by walking parallel and perpendicular transects to the alignment; to ensure that the species in the area of any possible indirect impacts would be inventoried as well. Approximately two days or 32 man-hours were taken to complete the inventory of plants occurring within the 5.5 mile stretch.

An inventory of plants observed during the rare plant survey is provided in Table A-1 (Appendix B). The habitat types within the proposed alignment and vicinity were classified and are described in the results section, below. Taxonomy follows the Jepson Manual (Hickman, 1993).

Results

The proposed pipeline alignment includes approximately 8.5 miles of agricultural land that is currently cultivated in row crops, barley, and orchards. The vegetation along the margins of the agricultural fields and orchards is dominated by ruderal (weedy) non-native grassland habitat.

Orchard

Orchards are located in two areas within the vicinity of the pipeline alignment. The first orchard is at the tie-in location to Line 400/401. The connecting pipeline will be located within an existing agriculture road between two plum orchards that extend approximately 0.6 mile to Hungry Hollow Slough. A small portion of orchards will be removed for the construction of the pipeline on the east side of the slough. Additionally, an almond orchard is located near County Road 87 and adjacent to the proposed alignment. The orchard communities are intensively managed and generally have an open understory vegetation to facilitate harvesting, though cover crops consisting of annual grasses and forbs are typically planted to reduce erosion and evaporation. Tree species are between 15-30 feet in height and uniformly spaced. As the Central Valley has a rich history in agriculture, orchards are prevalent throughout. The orchard community does not correspond with a natural vegetation classification identified in Sawyer/Keeler-Wolf (1995).

Irrigated Crops

Irrigated row crops are a dominant community within the Central Valley and are planted on the most fertile soils in the valley (CDFG, 2005). Alfalfa, tomatoes, and dry wheat are the predominant species grown along the length of the proposed pipeline. They are low-growing annual and perennial crops irrigated from adjacent canals and waterways (i.e., Hungry Hollow Slough, West Adams/Adams Canal, and the Sacramento River). As with

orchards, irrigated row crops are an anthropogenic community resulting from the demands of an increasing population and do not correspond to a natural vegetation classification.

California Annual Grassland

The proposed pipeline segment (along County Road 17) bisects the southern end of the Dunnigan Hills, from Interstate 505 to County Road 95A. The community type along this segment, approximately 5.5 miles, is primarily rolling hills with California Annual Grassland (Sawyer/Keeler-Wolf, 1995). Annual grassland is comprised largely of annual species of grasses and forbs that germinate with fall rains, grow slowly in the winter months, and remain low in stature until spring when increasing temperatures stimulate rapid growth. Characteristic grass species found in the community include wild oats (*Avena* spp.), soft chess (*Bromus hordeaceus*), vulpia (*Vulpia* spp.), and ryegrass (*Lolium* spp.). Annual forbs observed include lupine (*Lupinus bicolor*), filaree (*Erodium* spp.), blow-wives (*Achyrachaena mollis*), popcornflower (*Plagiobothrys nothofulvus*), fiddleneck (*Amsinckia menziesii* var. *intermedia*), and vetch (*Vicia* spp.).

Ecological and Rare Plant Information

Brewer's western flax (*Hesperolinon breweri*) and woolly-headed lessingia are found primarily on serpentine soils in a variety of communities, ranging from chaparral, woodlands, valley and foothill grasslands, broadleaf upland forests, coastal scrub, and coniferous forests. Although the survey area is a valley and foothill grassland community, serpentine soils are not present. The nearest reported occurrence of Brewer's western flax is near Monticello Dam in Napa County, approximately 15 miles southwest of the proposed pipeline and there are no documented occurrences for woolly-headed lessingia in the CNDDDB. Heckard's pepper grass (*Lepidium latipes* var. *heckardii*) is found primarily on alkaline flats which are absent from the project area. The nearest reported occurrence for this species is four miles north, in the town of Zamora from the year 1902. Baker's navarretia is a vernal pool species. Two seasonal wetlands were observed within the 500 foot survey area. Both areas lacked vernal pool endemic species and were dominated by ruderal species: Italian ryegrass (*Lolium multiflorum*), mannagrass (*Glyceria declinata*), and barley (*Hordeum marinum* ssp. *gussoneanum*). One of the seasonal wetlands is adjacent to an irrigation canal and has formed from the result of leaking. The final seasonal wetland is adjacent to County Road 17, in the same vicinity, and is dominated by barley and popcornflower. *Navarretia* species were not identified within the wetland and not found within the proposed alignment and 500-foot buffer. Round-leaved filaree (*Erodium macrophyllum*) inhabits clay soils of valley and foothill grasslands. Two *Erodium* species were observed in the alignment and buffer area: filaree (*Erodium botrys*), and red-stem filaree (*Erodium cicutarium*). Both species are considered ruderal and were found primarily along County Road 17. Round-leaved filaree was not observed. Adobe lily is primarily found on adobe soils in chaparral, woodlands, and valley and foothill grasslands. The proposed alignment and buffer do not provide habitat for the adobe lily (*Fritillaria pluriflora*).

Summary

No federal, state, or CNPS-listed plants were found during the surveys. The project area contains a host of non-native species and a few native species, but does not provide adequate habitat for any of the potential rare plants in the area. As surveys were conducted during an appropriate blooming period for all potential rare plants and none were found, further surveys will not be necessary to prove species absence in the project area.

References

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Appendix A

Special Status Plant Lists: CNDDB and CNPS

Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
1 <i>Agelaius tricolor</i> tricolored blackbird	ABPBXB0020			G2G3	S2	SC
2 <i>Ambystoma californiense</i> California tiger salamander	AAAAA01180	Threatened		G2G3	S2S3	SC
3 <i>Andrena blennospermatis</i> A vernal pool andrenid bee	IIHYM35030			G2	S2	
4 <i>Antrozous pallidus</i> pallid bat	AMACC10010			G5	S3	SC
5 <i>Athene cunicularia</i> burrowing owl	ABNSB10010			G4	S2	SC
6 <i>Atriplex cordulata</i> heartscale	PDCHE040B0			G2?	S2.2?	1B.2
7 <i>Branchinecta lynchi</i> vernal pool fairy shrimp	ICBRA03030	Threatened		G3	S2S3	
8 <i>Buteo swainsoni</i> Swainson's hawk	ABNKC19070		Threatened	G5	S2	
9 <i>California macrophyllum</i> round-leaved filaree	PDGER01070			G3	S3.1	1B.1
10 <i>Charadrius montanus</i> mountain plover	ABNNB03100			G2	S2?	SC
11 <i>Cicindela hirticollis abrupta</i> Sacramento Valley tiger beetle	IICOL02106			G5TH	SH	
12 <i>Desmocerus californicus dimorphus</i> valley elderberry longhorn beetle	IICOL48011	Threatened		G3T2	S2	
13 <i>Elanus leucurus</i> white-tailed kite	ABNKC06010			G5	S3	
14 <i>Emys (=Clemmys) marmorata marmorata</i> northwestern pond turtle	ARAAD02031			G3G4T3	S3	SC
15 <i>Falco peregrinus anatum</i> American peregrine falcon	ABNKD06071	Delisted	Endangered	G4T3	S2	
16 <i>Great Valley Mixed Riparian Forest</i>	CTT61420CA			G2	S2.2	
17 <i>Hesperolinon breweri</i> Brewer's western flax	PDLIN01030			G2	S2.2	1B.2
18 <i>Lepidium latipes var. heckardii</i> Heckard's pepper-grass	PDBRA1M0K1			G4T1	S1.2	1B.2
19 <i>Lepidurus packardii</i> vernal pool tadpole shrimp	ICBRA10010	Endangered		G3	S2S3	
20 <i>Myrmosula pacifica</i> Antioch multilid wasp	IIHYM15010			GH	SH	
21 <i>Navarretia leucocephala ssp. bakeri</i> Baker's navarretia	PDPLM0C0E1			G4T2	S2.1	1B.1
22 <i>Nycticorax nycticorax</i> black-crowned night heron	ABNGA11010			G5	S3	
23 <i>Pogonichthys macrolepidotus</i> Sacramento splittail	AFCJB34020			G2	S2	SC

Scientific Name/Common Name	Element Code	Federal Status	State Status	GRank	SRank	CDFG or CNPS
24 <i>Rana boylei</i> foothill yellow-legged frog	AAABH01050			G3	S2S3	SC
25 <i>Riparia riparia</i> bank swallow	ABPAU08010		Threatened	G5	S2S3	
26 <i>Taxidea taxus</i> American badger	AMAJF04010			G5	S4	SC
27 <i>Thamnophis gigas</i> giant garter snake	ARADB36150	Threatened	Threatened	G2G3	S2S3	
28 <i>Valley Oak Woodland</i>	CTT71130CA			G3	S2.1	

Appendix B

**List of Plant Species Observed During May and June 2007 Survey of the
PG&E Line 406 Project Site**

Table A-1. List of Plant Species Observed During May and June 2007

Family	Scientific Name	Common Name
Aceraceae	<i>Acer negundo</i> var. <i>californicum</i>	box elder
Agavaceae	<i>Agave americana</i>	agave
Amaranthaceae	<i>Amaranthus albus</i>	tumble pigweed
	<i>Amaranthus blitoides</i>	prostrate pigweed
	<i>Amaranthus palmeri</i>	Palmer amaranth
Anacardiaceae	<i>Toxicodendron diversilobum</i>	poison oak
Apiaceae	<i>Achillea millefolium</i>	yarrow
	<i>Daucus carota</i>	wild carrot
	<i>Foeniculum vulgare</i>	fennel
Apocynaceae	<i>Nerium oleander</i>	oleander
Asclepiadaceae	<i>Asclepias fascicularis</i>	Mexican whorled milkweed
	<i>Asclepias speciosa</i>	showy milkweed
Asteraceae	<i>Anthemis cotula</i>	stinking chamomile
	<i>Carduus pycnocephalus</i>	Italian thistle
	<i>Centaurea solstitialis</i>	yellow star thistle
	<i>Chamomilla suaveolens</i>	pineapple weed
	<i>Cichorium intybus</i>	chicory
	<i>Cirsium vulgare</i>	bull thistle
	<i>Conyza canadensis</i>	fleebane
	<i>Filago gallica</i>	narrowleaf cottonrose
	<i>Gnaphalium luteo-album</i>	cudweed
	<i>Helianthus annuus</i>	sunflower
	<i>Hemizonia congesta</i> var. <i>luzulifolia</i>	hayfield tarweed
	<i>Hemizonia fitchii</i>	Fitch's tarweed
	<i>Heterotheca grandiflora</i>	telegraph weed
	<i>Hypochaeris radicata</i>	hairy cat's ear
	<i>Lactuca serriola</i>	prickly lettuce
	<i>Lactuca saligna</i>	willowleaf lettuce
	<i>Picris echioides</i>	bristly ox-tongue
	<i>Psilocarphus tenellus</i>	woolly marbles
	<i>Silybum marianum</i>	milk thistle
	<i>Sonchus asper</i>	prickly sow thistle
	<i>Sonchus oleraceus</i>	common sow thistle
	<i>Taraxacum officinale</i>	dandelion
	<i>Tragopogon porrifolius</i>	salsify
	<i>Xanthium strumarium</i>	cocklebur
Boraginaceae	<i>Amsinckia menziesii</i> var. <i>intermedia</i>	fiddleneck

Table A-1. List of Plant Species Observed During May and June 2007

Family	Scientific Name	Common Name
	<i>Plagiobothrys stipitatus</i>	popcornflower
Brassicaceae		
	<i>Brassica nigra</i>	black mustard
	<i>Capsella bursa-pastoris</i>	Shepherd's purse
	<i>Hirschfeldia incana</i>	Mediterranean mustard
	<i>Raphanus sativus</i>	wild radish
Cactaceae		
	<i>Opuntia basilaris</i> var. <i>basilaris</i>	beavertail cactus
Caprifoliaceae		
	<i>Sambucus mexicana</i>	blue elderberry
Caryophyllaceae		
	<i>Silene gallica</i>	windmill pink
	<i>Spergula arvensis</i> ssp. <i>arvensis</i>	corn spurry
Casuarinaceae		
	<i>Casuarina stricta</i>	beefwood
Chenopodiaceae		
	<i>Chenopodium berlandieri</i>	netseed lambsquarters
	<i>Salsola tragus</i>	Russianthistle
Convolvulaceae		
	<i>Convolvulus arvensis</i>	field bindweed
Cupressaceae		
	<i>x Cupressocyparis leylandii</i>	Leyland cypress
Cyperaceae		
	<i>Cyperus eragrostis</i>	tall flatsedge
Euphorbiaceae		
	<i>Chamaesyce maculata</i>	spotted spurge
	<i>Eremocarpus setigerus</i>	turkey mullein
Fabaceae		
	<i>Caesalpinia</i> sp.	caesalpinia
	<i>Lotus humistratus</i>	hill lotus
	<i>Medicago polymorpha</i>	bur-clover
	<i>Medicago sativa</i>	alfalfa
	<i>Melilotus indica</i>	sourclover
	<i>Trifolium repens</i>	white clover
	<i>Trifolium hirtum</i>	rose clover
	<i>Vicia villosa</i>	hairy vetch
Fagaceae		
	<i>Quercus lobata</i>	valley oak
Geraniaceae		
	<i>Erodium botrys</i>	filaree
	<i>Erodium cicutarium</i>	red-stemmed filaree
	<i>Geranium dissectum</i>	cranesbill
Juglandaceae		
	<i>Juglans californica</i> var. <i>hindsii</i>	northern California black walnut
Lamiaceae		
	<i>Marrubium vulgare</i>	horehound
	<i>Trichostema lanceolatum</i>	vinegarweed

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Family	Scientific Name	Common Name
Liliaceae	<i>Brodiaea elegans</i> ssp. <i>elegans</i>	elegant brodiaea
	<i>Dichelostemma capitatum</i>	blue dicks
	<i>Triteleia hyacinthina</i>	white brodiaea
Malvaceae	<i>Malva neglecta</i>	common mallow
	<i>Malvella leprosa</i>	alkali mallow
Martyniaceae	<i>Proboscidea louisianica</i>	Devil's claw
Meliaceae	<i>Melia azedarach</i>	Chinaberry
Moraceae	<i>Ficus carica</i>	edible fig
	<i>Morus alba</i>	white mulberry
Myrtaceae	<i>Eucalyptus camaldulensis</i>	red gum
	<i>Eucalyptus globulus</i>	blue gum
Onagraceae	<i>Epilobium brachycarpum</i>	willow herb
Papaveraceae	<i>Eschscholzia californica</i>	California poppy
Pinaceae	<i>Cedrus deodara</i>	deodar cedar
Plantaginaceae	<i>Plantago lanceolata</i>	English plantain
Poaceae	<i>Arundo donax</i>	giant reed
	<i>Avena barbata</i>	slender wild oat
	<i>Avena fatua</i>	wild oat
	<i>Bromus alopecuroides</i>	weedy brome
	<i>Bromus diandrus</i>	ripgut brome
	<i>Bromus hordeaceus</i>	soft chess brome
	<i>Bromus madritensis</i>	brome
	<i>Cynodon dactylon</i>	Bermuda grass
	<i>Distichlis spicata</i>	saltgrass
	<i>Dactylis glomerata</i>	orchard grass
	<i>Gastridium ventricosum</i>	nit grass
	<i>Hordeum marinum</i>	Mediterranean barley
	<i>Hordeum murinum</i> ssp. <i>leporinum</i>	foxtail barley
	<i>Lolium multiflorum</i>	Italian ryegrass
	<i>Nassella pulchra</i>	purple needlegrass
	<i>Paspalum dilatatum</i>	dallis grass
	<i>Phalaris minor</i>	canarygrass
	<i>Polypogon monspeliensis</i>	Mediterranean beard grass
	<i>Sorghum halepense</i>	Johnsongrass
	<i>Taeniatherum caput-medusae</i>	medusa head
	<i>Triticum aestivum</i>	wheat

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Family	Scientific Name	Common Name
	<i>Vulpia bromoides</i>	fescue
Polygonaceae	<i>Polygonum arenastrum</i>	common knotweed
	<i>Rumex crispus</i>	curly dock
	<i>Rumex pulcher</i>	fiddle dock
Portulacaceae	<i>Portulaca oleracea</i>	common purslane
Rosaceae	<i>Prunus dulcis</i>	almond
	<i>Prunus persica</i>	peach
	<i>Rubus discolor</i>	Himalayan blackberry
Rubiaceae	<i>Galium aparine</i>	common bedstraw
Salicaceae	<i>Populus fremontii</i>	Fremont cottonwood
	<i>Populus nigra</i> 'Italica'	lombardy poplar
	<i>Salix babylonica</i>	weeping willow
	<i>Salix exigua</i>	sandbar willow
	<i>Salix gooddingii</i>	Goodding's willow
	<i>Salix laevigata</i>	red willow
Scrophulariaceae	<i>Bellardia trixago</i>	Mediterranean lineseed
	<i>Veronica americana</i>	American speedwell
Simaroubaceae	<i>Ailanthus altissima</i>	tree of heaven
Solanaceae	<i>Lycopersicon esculentum</i>	tomato
	<i>Pysocarpus ixocarpa</i>	tomatillo
Taxodiaceae	<i>Sequoia sempervirens</i>	redwood
Typhaceae	<i>Typha angustifolia</i>	narrowleaf cattail
Vitaceae	<i>Vitis vinifera</i>	European grape
Zygophyllaceae	<i>Tribulus terrestris</i>	puncture vine