

## **Appendix B-3**

### **Biological Evaluation – Plant Species**

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**BIOLOGICAL EVALUATION  
PLANT SPECIES**

**Pit 3 and 4 Hydroelectric Project License**

Hat Creek Ranger District, Lassen National Forest  
Shasta Lake Ranger District, Shasta-Trinity National Forests

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## I. INTRODUCTION

The purpose of this Biological Evaluation (BE) is to document analysis of the potential effects of the proposed relicensing for the Pit 3 and 4 Hydroelectric Project upon Pacific Southwest Region Forest Service designated Sensitive plant species. This BE is prepared in accordance with direction provided in Forest Service Manual (FSM) 2672.42 and implementing regulations [19 U.S.C. 1536 (c), 50 CFR 402.12 (f) and 402.14 (c)].

**Table 1. The Regional Forester's Sensitive Species list for Region 5 (dated June 8, 1998), identifies the following plant species which may occur on the Lassen and Shasta-Trinity National Forests:**

| COMMON NAME                | SCIENTIFIC NAME  |
|----------------------------|--|
| scabrid raillardella       | <i>Anisocarpus scabridus</i> (Eastw.) B.G. Baldwin<br>[= <i>Raillardiopsis scabrida</i> (Eastw.) Rydb.]                    |
| Constance's rockcress      | <i>Arabis constancei</i> Roll.   |
| Suksdorf's milkvetch       | <i>Astragalus pulsiferae</i> Gray var. <i>suksdorfii</i>   |
| upswept moonwort           | <i>Botrychium ascendens</i> W. H. Wagner   |
| scalloped moonwort         | <i>Botrychium crenulatum</i> W. H. Wagner  |
| mountain moonwort          | <i>Botrychium montanum</i> W. H. Wagner  |
| long-haired star tulip     | <i>Calochortus longebarbatus</i> Wats. var. <i>longebarbatus</i>   |
| Butte County morning glory | <i>Calystegia atriplicifolia</i> Hallier ssp. <i>buttensis</i> Brummitt  |
| Castle Crags bellflower    | <i>Campanula shetleri</i> Heckard  |
| Wilkins' bellflower        | <i>Campanula wilkinsiana</i> Greene  |
| Shasta chaenactis          | <i>Chaenactis suffrutescens</i> A. Gray  |
| white-stemmed clarkia      | <i>Clarkia gracilis</i> (Piper) Nels. & Macbr.<br>ssp. <i>albicaulis</i> (Jeps.) Lewis & Lewis                             |
| Lake Almanor fairyfan      | <i>Clarkia stellata</i> Mosq.  |
| slender bird's beak        | <i>Cordylanthus tenuis</i> Gray ssp. <i>pallescens</i> Penn.   |
| clustered lady's slipper   | <i>Cypripedium fasciculatum</i> Wats.  |
| mountain lady's slipper    | <i>Cypripedium montanum</i> Lindl.   |
| Oregon willowherb          | <i>Epilobium oreganum</i> Greene   |
| Brandegee's eriastrum      | <i>Eriastrum brandegeae</i> Mason  |
| Trinity buckwheat          | <i>Eriogonum alpinum</i> Engelm.   |
| Roderick's fawnlily        | <i>Erythronium citrinum</i> Wats. var. <i>roderickii</i> Shevock & Allen   |
| Butte County missionbells  | <i>Fritillaria eastwoodiae</i> Macfarlane  |
| Niles' madia               | <i>Harmonia doris-nilesiae</i> (T.W.Nelson & J.P. Nelson) B. G. Baldwin<br>[= <i>Madia doris-nilesiae</i> Nelson & Nelson] |
| Stebbins' madia            | <i>Harmonia stebbinsii</i> (T.W.Nelson & J.P. Nelson) B. G. Baldwin<br>[= <i>Madia stebbinsii</i> Nelson & Nelson]         |
| Baker's globe mallow       | <i>Iliamna bakeri</i> (Jeps.) Wiggins  |
| Pickering's ivesia         | <i>Ivesia pickeringii</i> Torr. ex Gray  |
| Castle Crags ivesia        | <i>Ivesia longibracteata</i> Ertter  |
| Red Bluff dwarf rush       | <i>Juncus leiospermus</i> F.J. Herm. var. <i>leiospermus</i>   |

| COMMON NAME                | SCIENTIFIC NAME  |
|----------------------------|--|
| Cantelow's lewisia         | <i>Lewisia cantelovii</i> J.T. Howell  |
| Bellinger's meadowfoam     | <i>Limnanthes floccosa</i> Howell ssp. <i>bellingiana</i> (M. Peck) Arroyo                     |
| Mt. Tedoc linanthus        | <i>Linanthus nuttallii</i> (Gray) Milliken ssp. <i>howellii</i> Nelson & Patterson             |
| Quincy lupine              | <i>Lupinus dalesiae</i> Eastw.   |
| Meesia (moss)              | <i>Meesia triquetra</i>  |
| ephemeral monkeyflower     | <i>Mimulus evanescens</i> R. Meinke  |
| peanut sandwort            | <i>Minuartia rosei</i> (Maguire & Barneby) McNeill   |
| Follett's monardella       | <i>Monardella follettii</i>  |
| Stebbin's monardella       | <i>Monardella stebbinsii</i>   |
| Shasta snow-wreath         | <i>Neviusia cliftonii</i> Shevock, Ertter, & D. Taylor   |
| slender orcutt grass       | <i>Orcuttia tenuis</i> Hitch.  |
| Plumas alpine aster        | <i>Oreostemma elatum</i> (Greene) Nesom  |
| thread-leaved beardtongue  | <i>Penstemon filiformis</i> (Keck) Keck  |
| close-throated beardtongue | <i>Penstemon personatus</i> Keck   |
| Cooke's phacelia           | <i>Phacelia cookei</i> Constance & Heckard   |
| Scott Valley phacelia      | <i>Phacelia greenei</i> J.T. Howell  |
| playa phacelia             | <i>Phacelia inundata</i> J. Howell   |
| profuse-flowered pogogyne  | <i>Pogogyne floribunda</i> Jokerst   |
| Modoc County knotweed      | <i>Polygonum polygaloides</i> ssp. <i>esotericum</i>   |
| Howell's alkali grass      | <i>Puccinellia howellii</i> Davis  |
| showy raillardella         | <i>Raillardella pringlei</i> Greene  |
| Columbia yellow cress      | <i>Rorippa columbiae</i> (Robinson) Howell   |
| Hall's scurf-pea           | <i>Rupertia hallii</i> (Rydb.) J. Grimes   |
| American Scheuchzeria      | <i>Scheuchzeria palustris</i> L. ssp. <i>americana</i> (Fern.) Hulten                          |
| Feather River stonecrop    | <i>Sedum albomarginatum</i> Clausen  |
| Canyon Creek stonecrop     | <i>Sedum paradisum</i> (M. Denton) M. Denton<br>(= <i>S. obtusatum</i> ssp. <i>paradisum</i> ) |
| Lewis' groundsel           | <i>Senecio eurycephalus</i> Gray var. <i>lewisrosei</i> (J.T. Howell) T.M. Barkley             |
| Red mountain catchfly      | <i>Silene campanulata</i> Wats. ssp. <i>campanulata</i>  |
| western campion            | <i>Silene occidentalis</i> S. Wats. ssp. <i>longistipitata</i> C. Hitchc. & Maguire            |
| English Peak greenbriar    | <i>Smilax jamesii</i> G. Wallace   |
| Greene's tuctoria          | <i>Tuctoria greenei</i> (Vasey) J. Reeder  |

There are two plant species of concern for this project: Lake Almanor fairyfan (*Clarkia stellata*) and mountain lady's slipper (*Cypripedium montanum*). No other sensitive plant species are known or suspected to occur within the project area (see Table 3).

## II. CURRENT MANAGEMENT DIRECTION

Current management direction for Sensitive species can be found in the following documents:

- Forest Service Manual and Handbooks (FSM/H 2670)
- National Forest Management Act (NFMA)
- National Environmental Policy Act (NEPA)
- Lassen National Forest Land and Resource Management Plan (LRMP 1992), as amended in 1994
- Shasta-Trinity Forest Land and Resource Management Plan (LRMP 1995)

General Forest Service direction for Sensitive species is summarized below. Additional management direction relevant to individual species is described in Appendix A.

- As part of the National Environmental Policy Act process, review programs and activities, through a biological evaluation, to determine their potential effect on sensitive species.
- Avoid or minimize impacts to species whose viability has been identified as a concern.
- If impacts cannot be avoided, analyze the significance of potential adverse effects on the population or its habitat within the area of concern and on the species as a whole.
- Establish management objectives in cooperation with the States when a project on National Forest System lands may have a significant effect on sensitive species population numbers or distribution.

Most of the National Forest System Lands within the project area are to be managed as Late Seral Reserves, or as riparian reserves. A small portion (around 10%) is under Matrix management. Matrix lands may be managed for multiple uses, but there is an emphasis on maintaining snags and coarse woody debris.

## III. DESCRIPTION OF THE PROPOSED PROJECT

### **Project Description**

The existing Pit River Project consists of three storage reservoirs, three powerhouses, and several diversions and conduits. The Pit 3 reservoir (Britton Lake), the Pit 3 dam and the Pit 3 powerhouse are on or adjacent to lands administered by the Lassen National Forest. The shoreline of Britton Lake, the dam and upper part of the reach are on private lands, while the majority of the lower reach and the powerhouse are located on public lands. The Pit 4 reservoir, dam, reach and powerhouse are on lands managed by the Shasta-Trinity National Forest. Reach 5 and associated facilities are all on private land. The Pit 5 reach and facilities will not be addressed in this evaluation.

**Ecological context:**

The eastern portion of the project area, including Lake Britton downstream to Big Bend, is within the Hat Creek Rim Ecological Section (M261Dj), of the Southern Cascades Section (M261D) of California (USDA, 1997). The remainder of the project area, below Big Bend, is within the Eastern Klamath Mountains Ecological Section (M261Ai), of the Klamath Mountains Section (M261A). The project is also within the Cascade Ranges as described by the Jepson Manual of Higher Plants of California (Hickman, 1993). Metavolcanic and metasedimentary soils are dominant and the climate is dry in the summer (USDA, 1983). Ultramafic soils are absent from the project area. Elevations in the project area range from 1400 to 2800 feet on the Pit River corridor.

Within the analysis area, the riparian corridor, consisting of riparian and upland vegetation within 350 feet of the centerline of the Pit River, from Pit 3 Dam to Pit 5 Powerhouse (i.e. below Lake Britton), was mapped at a scale of 1:2,000 (Garcia and Associates, 2001). General vegetation mapping of upland habitats was conducted along a two-mile corridor centered on the Pit River, from Highway 299 Bridge to Pit 5 Powerhouse (i.e. including Lake Britton), at a scale of 1:12,000 (Garcia and Associates, 2001).

The following table shows dominant cover types, first by percent of the project area (based on information in the DEIS on page 152 and Table 28), and next by percent of the riparian corridor below Lake Britton (Garcia and Associates, 2001). Several cover types that exist above Pit 3 dam do not appear below the dam.

***Table 2. Dominant cover types in the project area (this includes Pit 3, 4 and 5 reaches).***

| COVER TYPE                           | PERCENT OF PROJECT AREA | PERCENT OF RIPARIAN CORRIDOR |
|--------------------------------------|-------------------------|------------------------------|
| <b>Non-vegetation</b>                | <b>37%</b>              | <b>2%</b>                    |
| Reservoirs                           | 34%                     | <1%                          |
| Transmission corridors               | 2%                      | <1%                          |
| Other                                | 1%                      | <1%                          |
| <b>Upland vegetation</b>             | <b>62%</b>              | <b>76%</b>                   |
| Douglas-fir or Sierran mixed conifer | 34%                     | 65%                          |
| Jeffrey pine                         | 8%                      | NA                           |
| Oregon white oak                     | 5%                      | 6%                           |
| Ruderal (disturbed, weeds)           | 4%                      | <1%                          |
| Eastside ponderosa pine              | 3%                      | NA                           |
| Canyon live oak                      | 2%                      | 4%                           |
| Jeffrey pine-Oregon white oak        | 2%                      | NA                           |
| Black oak                            | 1%                      | <1%                          |
| Other                                | 3%                      | <1%                          |
| <b>Riparian</b>                      | <b>1%</b>               | <b>22%</b>                   |
| Torrent sedge or wet herb            | <1%                     | 2%                           |
| Brickellbrush                        | <1%                     | 3%                           |
| Willow shrub                         | <1%                     | 8%                           |
| White alder                          | <1%                     | 6%                           |

|                  |     |     |
|------------------|-----|-----|
| Black cottonwood | <1% | <1% |
| Oregon ash       | <1% | 1%  |
| Black oak        | <1% | 2%  |

Other minor types (<1%) in the non-vegetation include basalt cliffs, mines and seeps. These three types combined account for about 1% of the project area. Minor upland vegetation cover types include annuals/non-natives, bracken fern, wedgeleaf ceanothus/chaparral, greenleaf manzanita/chaparral, rubber rabbitbrush and ponderosa pine/Sierran mixed conifer dominated by ponderosa pine. These types combined, make up about 3% of the project area.

**Existing Project Operation**

The Pit 3 and 4 Projects make use of waters released from storage for power generation. FERC initiated the re-licensing process in October 1998. Since that time, the Forest Service has been involved with Pacific Gas and Electric (PG&E), resource agencies, non-governmental organizations, the Pit River Tribe, and other interested parties in the Pit River Collaborative Team (PRCT). Currently the river is managed with a minimum in-stream flow release of 150 cfs. Spring run-off (March to May) has higher flows of 3,000 to 5,000 cfs and sometimes up to 20,000 cfs. The rest of the year it ranges from 150 to 1,800 cfs. PG&E is currently allowed to draw down a total of 9 feet in Britton Reservoir, but due to a number of reasons, it is operated with a 6-foot draw down.

**Proposed Environmental Measures**

The Forest Service proposed Preliminary 4(e) Conditions in October 2002. The first 20 are standard conditions that have no physical impacts on sensitive plants or their habitats. The Project Specific Conditions 21-54 include a range of conditions, about half of which are plans or surveys that have no impact on habitats or species. Those conditions that have the potential to affect habitat are summarized below.

- Vegetation management plan includes prescribed burning in oak and conifer over around 920 acres to rejuvenate brush and reduce fuels; revegetation of spoil piles and management of vegetation under transmission lines--incorporated into Land & Habitat Management Plans (LHMP) for Mitigating Project Effects to NFS Resources
- Noxious weed management plan, including prevention, treatment, and monitoring—incorporated into LHMP.
- Sensitive Species plan, directing preparation of a biological evaluation evaluating the potential impact of new project construction actions on species or its habitat--incorporated into LHMP.
- Recreation plan, including addition of information kiosks at existing sites; reconstruction of developed and undeveloped sites (campgrounds, boat launches, new trails, and new parking areas); Upper Britton OHV plan, road/trail rehabilitation; and development of access points for white-water boaters--incorporated into LHMP.

- Road rehabilitation plan; this includes re-paving, expanding the existing paving, replacing three bridges and installing culverts at spring locations--incorporated into LHMP.

#### IV. SPECIES ACCOUNTS AND EFFECTS

The following table lists those species introduced in Section I, their preferred habitats, and whether, based on the activities the project proposes, the species has the potential of being impacted by any of the proposed activities on NFS lands. Species that may be affected by the activities proposed under this project are highlighted.

**Table 3. Sensitive plant species that may be present or affected by activities, and their potential to occur in the Pit 3 and 4 Project area affected by the proposed issuance of the FERC License.**

| Species  | Elevation Range of Habitat (ft) | Preferred Habitat  | Potential for Project to Affect this Species   |
|--|---------------------------------|--|--|
| scabrid raillardella<br><i>Anisocarpus scabridus</i>                                 | Above 5500 ft.                  | Rock outcrops, talus or scree in upper montane forest  | None. Suitable habitat does not occur within the project area.   |
| Constance's rockcress<br><i>Arabis constancei</i>                                    | 3800 to 6600 ft.                | Serpentine rock outcrops in mixed conifer forest   | None. The analysis area is outside of the range for this species, which is found in Plumas & Sierra Counties.                      |
| Suksdorf's milkvetch<br><i>Astragalus pulsiferae</i> var. <i>suksdorfii</i>          | 4400 to 6600 ft.                | Sagebrush flats & slopes   | None. Suitable habitat does not occur within the project area.   |
| Upswept moonwort<br><i>Botrychium ascendens</i>                                      | Above 4000 ft.                  | Moist meadow and woods habitat along streams in alluvial soils subject to seasonal inundation      | None. Suitable habitat does not occur within the project area.   |
| scalloped moonwort<br><i>Botrychium crenulatum</i>                                   | 4500 to 7500 ft.                | marshes, mesic meadows, and in coniferous forests in alluvial soils subject to seasonal inundation | None. Suitable habitat does not occur within the project area.   |
| mountain moonwort<br><i>Botrychium montanum</i>                                      | 500 to 6300 ft                  | mesic meadows and coniferous forests near streams  | Suitable habitat may occur within the project area, but PG&E field surveys in 2000 did not detect any occurrences of this species. |
| long-haired star tulip<br><i>Calochortus longebarbatus</i> var. <i>longebarbatus</i> | 4000 to 6200 ft.                | Seasonally wet meadows on heavy clay soil.   | None. Suitable habitat does not occur within the project area  |
| Butte County morning-glory<br><i>Calystegia atriplicifolia</i> ssp. <i>buttensis</i> | 1800 to 3600 ft.                | openings in lower montane conifer forest   | Suitable habitat occurs within the project area, but PG&E field surveys in 2000 did not detect any occurrences of this species.    |
| Castle Crag bellflower<br><i>Campanula shetleri</i>                                  | 4,000 to 6,000                  | Granodiorite cliffs  | None. The analysis area is outside of the range for this species, which is endemic to Castle Crag.                                 |
| Wilkins' bellflower  | 5700 to 8600                    | Streams, seeps, & springs  | None. Suitable habitat does not occur within   |

|   |                       |   |   |
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| <i>Campanula wilkinsiana</i>  | ft.                   | in upper montane or subalpine forests & meadows   | the project area.   |
| Shasta chaenactis<br><i>Chaenactis suffrutescens</i>                      | 2600 to 6900 ft.      | Rocky slopes or river terraces with serpentine influence  | None. The analysis area is outside of the range for this species, which is found in Siskiyou & Trinity Counties.  |
| white-stemmed clarkia<br><i>Clarkia gracilis</i> ssp. <i>albicaulis</i>   | 500 to 2600 ft.       | Open slopes in chaparral or mixed conifer forest  | None. The analysis area is outside of the range for this species, which is found in Butte & Tehama Counties.  |
| Lake Almanor fairyfan<br><i>Clarkia stellata</i>                          | Primarily below 6,000 | Openings in mixed conifer forest; sometimes associated with disturbance                               | Occupied habitat occurs within the analysis area.   |
| slender bird's beak<br><i>Cordylanthus tenuis</i> ssp. <i>pallescens</i>  | 3600 to 5200 ft.      | Gravelly soil in openings of lower montane mixed conifer forest                                       | None. The analysis area is outside of the range for this species, which is found in Siskiyou County.  |
| clustered lady's slipper<br><i>Cypripedium fasciculatum</i>               | 1300 to 6000 ft.      | Mixed conifer or oak forests on a variety of soil types, often but not always associated with streams | Suitable habitat occurs within the project area, but PG&E field surveys in 2000 did not detect any occurrences of this species.                           |
| mountain lady's slipper<br><i>Cypripedium montanum</i>                    | 600 to 6500 ft.       | Mixed conifer or oak forests on a variety of soil types, often but not always associated with streams | Occupied habitat occurs within the analysis area.   |
| Oregon willowherb<br><i>Epilobium oregonum</i>                            | 1500 to 7400 ft.      | Wet places, usually on ultramafic soils   | Suitable habitat may occur within the project area, but PG&E field surveys in 2000 did not detect any occurrences of this species.                        |
| Brandegee's eriastrum<br><i>Eriastrum brandegeae</i>                      | 1500 to 2600 ft.      | Dry flats in chaparral or closed-cone pine forests  | None. The analysis area is outside of the range for this species, which is found in the North Coast Ranges, west of the Central Valley.                   |
| Trinity buckwheat<br><i>Eriogonum alpinum</i>                             | 6700 to 9000 ft.      | Heavily serpentinized talus slopes & ridges   | None. The analysis area is outside of the range for this species, which is found in the high mountains of the Eastern Klamath Ranges.                     |
| Roderick's fawnlily<br><i>Erythronium citrinum</i> var. <i>roderickii</i> | 900 to 4000 ft.       | Montane mixed conifer forest  | None. The analysis area is outside of the range for this species, which is found in northern Trinity County.  |
| Butte County missionbells<br><i>Fritillaria eastwoodiae</i>               | 1000 to 4000 ft.      | Chaparral, foothill woodland, and mixed conifer forest openings                                       | Suitable habitat occurs within the analysis area, but PG&E field surveys in 2000 did not detect any occurrences of this species.                          |
| Niles' madia<br><i>Harmonia doris-nilesiae</i>                            | 2100 to 5500 ft.      | dry, stony serpentine openings in mixed conifer-oak forest or chaparral                               | None. The analysis area is outside of the range for this species, which is endemic to the southern Klamath Ranges & northeastern Inner North Coast Ranges |
| Stebbins' madia<br><i>Harmonia stebbinsii</i>                             | 2100 to 6000 ft.      | dry, stony serpentine openings in chaparral or woodland   | None. The analysis area is outside of the range for this species, which is endemic to the southern Klamath Ranges & northeastern Inner North Coast Ranges |
| Baker's globe mallow<br><i>Iliamna bakeri</i>                             | 3800-6800 ft.         | Chaparral, pine or mixed conifer/oak forest, juniper woodland; on rocky soil                          | Suitable habitat occurs within the analysis area, but PG&E field surveys in 2000 did not detect any occurrences of this species.                          |
| Castle Crag ivesia<br><i>Ivesia longibracteata</i>                        | 4300 to 4900 ft.      | Granodiorite cliffs   | None. The analysis area is outside of the range for this species, which is endemic to Castle Crag.  |
| Pickering's ivesia<br><i>Ivesia pickeringii</i>                           | 2700 to 4900 ft.      | Seasonally wet areas in conifer forest on ultramafic soils.   | None. The analysis area is outside of the range for this species, which is found in northern Trinity County and adjacent Siskiyou County.                 |
| Red Bluff dwarf rush  | 200 to 1000 ft.       | Edges of vernal pools & swales in chaparral, foothill   | Suitable habitat occurs within the analysis area, but PG&E field surveys in 2000 did not detect   |

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| <i>Juncus leiospermus</i><br>var. <i>leiospermus</i>                              |                  | woodland, and valley grasslands  | any occurrences of this species.  |
| Cantelow's lewisia<br><i>Lewisia cantelovii</i>                                   | 1000 to 3500 ft. | Moist north-facing cliffs  | Suitable habitat may occur within the analysis area, but PG&E field surveys in 2000 did not detect any occurrences of this species.                       |
| Bellinger's meadowfoam<br><i>Limnanthes floccosa</i><br>ssp. <i>bellingeriana</i> | 3100 to 3600 ft. | vernal pools & other seasonally wet places in pine-oak woodlands                   | Suitable habitat may occur within the analysis area, but PG&E field surveys in 2000 did not detect any occurrences of this species.                       |
| Mt. Tedoc linanthus<br><i>Linanthus nuttallii</i><br>ssp. <i>howellii</i>         | 4600 to 5800 ft. | open Jeffrey pine forest or mixed conifer forest                                   | None. The analysis area is outside of the range for this species, which is endemic to the High North Coast Ranges   |
| Quincy lupine<br><i>Lupinus dalesiae</i>  | 2900 to 6300 ft. | open, dry mixed conifer forest   | None. The analysis area is outside of the range for this species, which is endemic to the northern High Sierra Nevada.                                    |
| Meesia (moss)<br><i>Meesia triquetra</i>  |                  | Cold, spring-fed fens  | None. Suitable habitat does not occur within the project area.  |
| ephemeral monkeyflower<br><i>Mimulus evanescens</i>                               | 3800 to 5300 ft. | Vernally inundated moist, heavy, gravelly clay soils in sagebrush and juniper veg. | Suitable habitat may occur within the analysis area, but PG&E field surveys in 2000 did not detect any occurrences of this species.                       |
| peanut sandwort<br><i>Minuartia rosei</i>   | 2300 to 4600 ft. | jeffrey pine/incense cedar woodlands on ultramafic soil                            | None. The analysis area is outside of the range for this species, which is endemic to the southern Klamath Ranges & northeastern Inner North Coast Ranges |
| Follett's monardella<br><i>Monardella follettii</i>                               | 4200 to 6300 ft. | Serpentine in open mixed conifer forest  | None. Suitable habitat does not occur within the project area.  |
| Stebbin's monardella<br><i>Monardella stebbinsii</i>                              | 2600 to 4800 ft. | Serpentine outcrops  | None. Suitable habitat does not occur within the project area.  |
| Shasta snow-wreath<br><i>Neviusia cliftonii</i>                                   | 900 to 1600 ft.  | shady, cool stream canyons around Shasta Lake, usually on limestone-derived soils  | None. Suitable habitat does not occur within the project area.  |
| slender orcutt grass<br><i>Orcuttia tenuis</i>                                    | 100 to 5700 ft.  | deep vernal pools  | None. Suitable habitat does not occur within the project area.  |
| Plumas alpine aster<br><i>Oreostemma elatum</i>                                   | 3600 to 6800 ft. | wet meadows in mixed conifer forest  | None. Suitable habitat does not occur within the project area.  |
| thread-leaved beardtongue<br><i>Penstemon filiformis</i>                          | 1500 to 6200 ft. | openings in montane forest & chaparral on ultramafic soils.                        | None. The analysis area is outside of the range for this species, which is endemic to the southern Klamath Ranges.  |
| close-throated beardtongue<br><i>Penstemon personatus</i>                         | 4500 to 6400 ft. | mixed conifer forest with Shasta red fir   | None. Suitable habitat does not occur within the project area.  |
| Cooke's phacelia<br><i>Phacelia cookei</i>  | 4300 to 5000 ft. | volcanic sand in ponderosa pine-juniper woodland                                   | None. The analysis area is outside of the range for this species, which is endemic to Siskiyou County on the north side of Mt. Shasta.                    |
| Scott Valley phacelia<br><i>Phacelia greenei</i>                                  | 5000 to 7000 ft. | bare serpentine openings in montane conifer forest                                 | None. The analysis area is outside of the range for this species, which is endemic to the southern Klamath Ranges.  |
| playa phacelia<br><i>Phacelia inundata</i>  | 4500 to 6000 ft. | Playas in Great Basin scrub or montane conifer forest                              | None. Suitable habitat does not occur within the project area.  |
| profuse-flowered pogogyne<br><i>Pogogyne floribunda</i>                           | 3200 to 5000 ft. | Seasonally wet areas in silver sage flats of pine-juniper woodlands                | Suitable habitat may occur within the analysis area, but PG&E field surveys in 2000 did not detect any occurrences of this species.                       |

|   |                                |  |   |
|---|--------------------------------|--|---|
| Modoc County knotweed<br><i>Polygonum polygaloides</i> ssp. <i>esotericum</i> | 4900 to 5200 ft.               | Vernal pools, swales, & seasonally wet areas in heavy clay.                                      | None. The analysis area is outside of the range for this species, which is endemic to the Modoc Plateau.  |
| Howell's alkali grass<br><i>Puccinellia howellii</i>                          | 1400 ft.                       | Mineralized cold salt springs  | None. The analysis area is outside of the range for this species, which is known from a single site west of Redding.  |
| showy raillardella<br><i>Raillardella pringlei</i>                            | 4000 to 7500 ft.               | Wet meadows on ultramafic soil, usually with <i>Darlingtonia</i>                                 | None. The analysis area is outside of the range for this species, which is endemic to the eastern Klamath Ranges.   |
| Columbia yellow cress<br><i>Rorippa columbiae</i>                             | 4200 to 5600 ft. in California | Seasonally inundated lake beds & stream banks with little other vegetation                       | None. The analysis area is outside of the range for this species, which is endemic to the Modoc Plateau of Lassen, Modoc, and Siskiyou Cos. plus eastern OR & WA. |
| Hall's scurf-pea<br><i>Rupertia hallii</i>                                    | 2600 to 4500 ft.               | Forest openings  | None. The analysis area is outside of the range for this species, which is endemic to Butte & Tehama Counties.  |
| American Scheuchzeria<br><i>Scheuchzeria palustris</i> ssp. <i>americana</i>  | 4000 to 6000 ft.               | Floating mats, bogs, lake margins  | None. In California this species is known from a single floating bog in Plumas Co.  |
| Feather River stonecrop<br><i>Sedum albomarginatum</i>                        | 1000 to 5600 ft.               | Steep serpentine rock outcrops & weathered ultramafic soils in mixed conifer forest              | None. The analysis area is outside of the range for this species, which is endemic to the Feather River drainage of Butte & Plumas Counties.                      |
| Canyon Creek stonecrop<br><i>Sedum paradisum</i>                              | 900 to 6200 ft.                | Rock outcrops, gravel or scree of various mineralogies, in mixed conifer-oak forest or chaparral | None. The analysis area is outside of the range for this species, which is endemic to the southern Klamath Ranges, in or adjacent to Trinity County.              |
| Lewis' groundsel<br><i>Senecio eurycephalus</i> var. <i>lewisrosei</i>        | 900 to 3200 ft.                | serpentine rock outcrops & weathered ultramafic soils in mixed conifer forest                    | None. The analysis area is outside of the range for this species, which is endemic to the Feather River drainage of Butte & Plumas Counties.                      |
| red mountain catchfly<br><i>Silene campanulata</i> ssp. <i>campanulata</i>    | 1400 to 6300 ft.               | Openings in lower montane conifer forest or chaparral, on ultramafic soils                       | None. The analysis area is outside of the range for this species, which is endemic to the southern Klamath and Coast Ranges.                                      |
| western champion<br><i>Silene occidentalis</i> ssp. <i>longistipitata</i>     | 3000 to 6000 ft.               | Chaparral or conifer forest  | Suitable habitat may occur within the analysis area, but PG&E field surveys in 2000 did not detect any occurrences of this species.                               |
| English Peak greenbriar<br><i>Smilax jamesii</i>                              | 2700 to 8000 ft.               | Riparian forest or moist slopes in montane forest  | Suitable habitat may occur within the analysis area, but PG&E field surveys in 2000 did not detect any occurrences of this species.                               |
| Greene's tuctoria<br><i>Tuctoria greenei</i>                                  | 200 to 3500 ft.                | Vernal pools in grassland or open pine forest  | Suitable habitat may occur within the analysis area, but PG&E field surveys in 2000 did not detect any occurrences of this species.                               |

Based on knowledge of distribution and habitats in the project area, and botanical field surveys by professional botanists documenting the absence of sensitive plants from suitable habitats within the project area, most of the species in Table 3 will not be analyzed further. Implementation of this project with license conditions will have no impact on these species.

This biological evaluation documents potential effects from this project on *Clarkia stellata*, star clarkia, and *Cypripedium montanum*, mountain lady's slipper, Forest Service Region 5 Sensitive plant species, which are known or suspected to occur within the project area. No other currently listed FS Sensitive plants are known or expected from the project area. These two species vary in how they might be affected by the conditions attached to the license. Neither will be directly affected by changes in stream flows, but could be indirectly affected by related changes in recreational use of the area, road and transmission corridor maintenance, and invasive exotic plant competition, among other possible impacts. The following analysis of effects will focus on those conditions that may directly, indirectly or cumulatively affect each individual species.

License condition No. 36 requires development of a "Protection of Sensitive Species Plan". This says that before the licensee takes any action on NFSL that may affect a sensitive species, the Licensee shall prepare a biological evaluation and submit it to the Forest Service. The biological evaluation shall 1) develop procedures to minimize adverse effects, 2) ensure the project shall meet restrictions included in site-specific management plans, and 3) develop implementation and effectiveness monitoring of measures taken to reduce effects.

## Species Information

### **Lake Almanor Fairyfan (*Clarkia stellata*)**

#### **Existing Environment.**

#### **Species and Habitat Account.**

*Clarkia stellata* is an early summer annual in the evening primrose family, with lavender-purple flowers. It has erect stems up to 3 feet tall (usually 1-2'). Seeds germinate in the spring and plants flower June to July, with seeds developing over several weeks. It is very similar to the common *Clarkia rhomboidea*, with which it has been confused in the past.

*Clarkia stellata* grows in open areas within mixed conifer forests. Its specific habitat is usually full sun and little or no duff. Most occurrences are on road cutbanks, clearcuts, or naturally open, rocky areas. Under natural conditions it is probably a fire follower, although what kinds of fire are suitable is not known.

**Abundance:** Since being put on the R5 Sensitive Plant List in 1998, this species has been documented from 55 occurrences on the Lassen National Forest, approximately 40 occurrences on the Plumas National Forest and over 100 occurrences on the Tahoe National Forest. Surveys for the Pit 3, 4, and 5 Project added seven occurrences from Shasta County, ranging in size from 2 to 15 individuals.

**Range/Distribution:** Southern Cascades and northern Sierra Nevada, from Plumas, Tehama, Placer, Nevada, Shasta, Sierra and Yuba Counties in California.

## **Effects of the Proposed Action.**

### **Direct and Indirect Effects.**

Three populations of *Clarkia stellata* are along the PG&E access road to Deep Creek Campground, and could be directly affected by road maintenance activities, including grading and weed control. Botanical survey maps show Klamath weed (aka St. John's wort, *Hypericum perforatum*) along the Deep Creek road near *Clarkia stellata*. Soil disturbance, particularly during the flowering season, could eliminate plants and disrupt the seed bank. On the other hand, the clarkia may be indirectly affected by competition from Klamath weed, which has spread extensively along project roads and, left unchecked, is likely to spread further.

Two populations are in the transmission line corridor for Pit 3 powerhouse, on the steep north-facing slope on the south side of the Pit River. They could be affected by right-of-way or line maintenance.

One population is along the Pacific Crest Trail not far from the Burney Falls State Park HQ, where trail maintenance and foot traffic are potential effects indirectly related to the project.

The last population is across Hwy. 299 from Hat Creek Park, and would not be directly or indirectly affected by the project.

Light to moderate soil disturbance and local canopy thinning or removal would probably have beneficial effects on the clarkia, stimulating its seed bank, if present, to germinate under favorable weather conditions. The risk is that weeds also respond well to soil disturbance and canopy removal, and may invade and suppress the clarkia.

**Cumulative Effects.** The large (and increasing) number of recently documented populations of *Clarkia stellata*, within its limited geographic range, make it difficult to discern the trend of the species overall. Since the species responds well to some disturbance, cumulative effects at this time are probably negligible.

### **Recommendations.**

Explicitly include *Clarkia stellata* in development of plans for implementing the following components of the Land & Habitat Management Plans license condition:

- Vegetation & Noxious Weeds Management Plan—prescribed burning in oak and; revegetation of spoil piles and management of vegetation under transmission lines;
- Vegetation & Noxious Weeds Management Plan—management of noxious weeds;
- Protection of TES Species—PG&E to prepare a biological evaluation evaluating the potential impact of its proposed actions submit it to the Forest Service for approval
- Roads and Facilities Management Plan—road rehabilitation;

Consider applying a Limited Operating Period for these project activities in the vicinity of known populations (no activities until plants have set seed).

**Determination.** Implementation of the license conditions may affect *Clarkia stellata* individuals or habitat, but will not likely contribute to a trend toward Federal listing or cause a loss of viability to the species.

## **Mountain lady's slipper (*Cypripedium montanum*)**

### **Existing Environment.**

#### **Species and Habitat Account.**

*Cypripedium montanum* is a long-lived, rhizomatous, autotrophic orchid that has a symbiotic relationship with a soil fungus that begins with germination and may last until the plant dies (Seevers and Lang, 1998). It has erect stems up to 3 feet tall (usually 1-2'). Seeds are tiny and require penetration by a particular fungus in order to germinate. Other mycorrhizal fungi are associated with adult lady's-slipper plants. Individuals may remain dormant underground for a decade or more, making it difficult to accurately monitor population size.

Mountain lady's-slipper habitat is very broad, occurring in Douglas-fir, white fir, and mixed conifer forests in the mid-late seral stages, as well as oak woodlands and riparian areas. A majority of the known sites occur between 2500 and 4000'; aspect is primarily northerly; slope is between 25 and 50%; canopy closure is generally between 60 and 80%. The substrate is varied and includes such types as ultramafic and limestone. Optimum habitat has not been identified in early successional communities. Exceptions to this general habitat description do exist, which demonstrates the difficulty in identifying key habitat characteristics. Given the reproductive and establishment complexity of this species, micro-habitat variables appear to be important.

**Abundance:** This species has previously been documented from 2 occurrences on the Lassen National Forest, 16 occurrences on the Shasta-Trinity National Forest, 12 occurrences on the Plumas National Forest, 10 occurrences on the Sierra National Forest, 11 on the Mendocino, 5 on the Modoc, 5 on the Six Rivers National Forest, and 9 occurrences on the Stanislaus National Forest. Most populations have fewer than ten individuals in any given year; a few populations have as many as fifty individuals. Surveys for the Pit 3, 4, and 5 Project added four occurrences from Shasta County, ranging in size from 2 to ca. 30 individuals (Chainey-Davis, 2000).

**Range/Distribution:** Numerous counties throughout California from Del Norte to Sierra County. Also occurs in 6 other western states. Populations are highly isolated.

### **Effects of the Proposed Action.**

#### **Direct and Indirect Effects.**

Three populations of mountain lady's-slipper are associated with springs 50-450 feet above the south shoreline of Lake Britton. These populations appear to be currently undisturbed and unaffected by project operations. Noxious weed invasion is possible in the future.

One population is in the transmission line corridor for Pit 3 powerhouse, on the steep north-facing slope on the south side of the Pit River. It could be affected by right-of-way or line maintenance.

Any ground disturbing or shade removal activity can be detrimental to individuals and populations, including canopy removal, stand-replacing fire, trampling by recreationists or animals, grazing, personal collection, and mechanical or herbicide vegetation management. The Modoc NF specifically identified that 4 of the 5 populations had been grazed; on the Lassen NF one of the 2 populations may be lost due to a proposed land exchange; and most of the populations on Shasta-Trinity NF are in commercial timber land with the one population in the SIA next to a recreational trail, therefore vulnerable to collection. Shasta-Trinity also noted that plants in its largest mountain lady's-slipper population were killed a 1987 wildfire; to date, there has been no recruitment. Additionally, populations are often very small and highly isolated; therefore, concerns exist related to population size, genetic fitness and the overall viability of the species.

The project may have indirect impacts on mountain lady's-slipper habitat or undiscovered populations in the analysis area. If fuel levels are maintained at their current or higher levels (no thinning treatment), there is threat of higher intensity wildfire that could result in greater impacts to habitat for these species. These impacts include potential death of underground reproductive tissues from higher than normal soil heating, complete loss of conifer overstory in riparian areas as well as adjacent uplands resulting in much higher forest floor temperatures and unsuitable growing conditions, and loss of associated mycorrhizal soil fungi necessary for lady's-slipper survival (Shefferson, 2002). Where complete death of lady's-slipper plants is not experienced, extended periods of dormancy (>10 years) could be expected. Low intensity wildfire (expected with thinning) does not produce the same degree of adverse fire impacts and is considered beneficial to the species.

Lady's-slipper orchids are naturally more vulnerable to environmental impacts than many other vascular plant species because of their low reproductive rate and reliance on vegetative methods of reproduction. Vegetative reproduction reduces the amount of genetic exchange between plants which reduces a species ability to resist adverse environmental impacts, such as broad-scale disease. Lady's-slipper populations also tend to include a low number of individuals, increasing the likelihood that loss of any number of plants in a population will be a significant number. Loss of any individuals in a population from high intensity wildfire can be expected to have a greater significance for lady's-slipper orchids than other species, and a higher possibility of eventual loss of the entire population from too few numbers.

**Cumulative Effects.** Loss or damage to the small population under the Pit 3 transmission line would contribute to similar cumulative effects across the range of the species. The other populations are likely to remain undisturbed and therefore will not contribute to cumulative effects.

### **Recommendations.**

Management recommendations promulgated by federal agencies for mountain lady's-slipper, as part of the Northwest Forest Plan (SeEVERS and Lang, 1998), are as follows:

1. *Mitigate disturbance to known sites to maintain current microclimate conditions of the habitat area until basic habitat and life history requirements are understood.*
2. *Avoid direct mechanical damage to plants, or changes in soil moisture and temperature, or the nature of the duff layer.*
3. *Maintain overstory canopy coverage at 60 percent or more to prevent increased sunlight to the site.*

For the Pit 3, 4, and 5 Project, recommended specific mitigations for this species are as follows: Explicitly include *Cypripedium montanum* in development of plans for implementing the following components of the Land and Habitat Management Plans (LHMP) license conditions:

- Vegetation & Noxious Weeds Management Plan—prescribed burning in oak and conifer forests, and management of vegetation under transmission lines;
- Vegetation & Noxious Weeds Management Plan—management of noxious weeds;
- Protection of TES species Plan—PG&E to prepare a biological evaluation evaluating the potential impact of its proposed actions submit it to the Forest Service for approval
- Recreation Management Plan-addressing recreational concerns. These conditions include addition of information kiosks at existing sites; reconstruction of developed and undeveloped sites (campgrounds, boat launches, new trails, and new parking areas); develop an Upper Britton OHV plan, which could include seasonal or yearlong restrictions and road/trail rehabilitation
- Road and Facilities Management Plan-road rehabilitation; this includes re-paving, expanding the existing paving, replacing three bridges and installing culverts at spring locations.

**Determination.** Implementation of the license conditions may affect *Cypripedium montanum* individuals or habitat, but will not likely contribute to a trend toward Federal listing or cause a loss of viability to the species.

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