Special-Status and Special-InterestPlant, Lichen, and Fungi Species in the StudyArea(BR-S2)

UpdatedJuly 2009

TECHNICAL MEMORANDUM (TM-12)

DATE:	July10, 2009
TO:	Relicensing Participants
FROM:	Steve Nevares (PG&E) and Nicole Jurjavcic (Stillwater Sciences)
SUBJECT:	Summary of 2007, 2008, and 2009 surveys of special-status and special-interest plant, lichen, and fungi species (BR-S2)

This Technical Memo has been updated with additional information that was developed since the document was last updated on February 17, 2009. Any new text provided since the document was last updated on February 17, 2009 is shaded. Any changed or new figures have shaded captions and any changed or new tables have shaded table titles.

1 STUDYOBJECTIVES

The goal of this study is to develop the essential, additional information necessary to supplement existing information and address the following issue:

> Project operation and maintenance activities (*e.g.,* vegetation management around Project facilities, road maintenance and scheduled repair work, and other Project-related activities) and Project recreation activities involve ground and vegetation disturbance that have the potential to affect special-status and special-interest plant, lichen, and fungi species.

The McCloud-Pit Project (Project) Pre-Application Document (PAD), July 27, 2006, identified that no comprehensive surveys have been conducted to identify the occurrences and locations of special-status and special-interest plant, lichen, and fungi species in the Project-affected Area (PG&E 2006). The purpose of this study is to (1) provide specific information about the abundance and distribution of special-status and special-interest plant, lichen, and fungi species within the Project-affected Area, and (2) assess if populations of any of these species may be affected by Project operation, maintenance, or recreation activities. For the purposes of this study, special-status plant, lichen, and fungi species are defined as follows: those listed, proposed, or under review as rare, threatened, or endangered by the federal government and/or the state of California; those listed as rare or endangered by the California Native Plant Society (CNPS); those listed by the U.S. Forest Service (USFS) as sensitive or special-interest; those listed as part of the Northwest Forest Plan as Survey and Manage species; and those listed as special-interest by the Bureau of Land Management (BLM). Special-interest species include the

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following: native plant species' populations suitable for revegetation source material; culturally significant plant species, as defined by the Pit River and Winnemem Wintu Tribes (Tribes); and *Sambucus mexicana* (elderberry) plants suitable for valley elderberry longhorn beetles (*i.e.*, located below 3,000-ft elevation, with stems equal to or greater than 1 in. in diameter).

2 STUDY AREA

The Study Area includes the land within the Project-affected Area, focusing on those areas where ground-disturbing activities, recreation, or development are proposed or likely to occur. The following areas were surveyed in spring and summer of 2007 (Figures 1 – 3):

For the southern portion of McCloud Reservoir (*i.e.*, from the boat ramp gate [Tarantula Gulch] south and to the Star City gate) the extent of USFS Road No. 38N11 within the legal public easement width plus all Licensee-owned or National Forest System (NFS) lands (*i.e.*, excluding private lands) between the outside road limit to the high water mark;

On the northwestern shoreline of McCloud Reservoir, NFS lands in the southwest corner of Section 10;

For the Iron Canyon Dam and Reservoir, the Federal Energy Regulatory Commission (FERC) Project boundary or the outside perimeter road edge, whichever is farther from the reservoir**,** focusing on areas where human disturbance is evident (*e.g.*, pull-outs, roads, trails, campsites) and survey areas for potential development (*e.g.*, flat-to-gently sloping peninsula areas, particularly if they were identified as potential areas for development in the Iron Canyon Recreation Plan);

A 200-ft buffer (*i.e.*, 100 ft on either side) around the dam face of Pit 6 and 7 reservoirs and Pit 7 Afterbay;

A 200-ft buffer (*i.e.*, 100 ft on either side of centerline) off of above-ground features of both the McCloud Tunnel (including the Hawkins Tunnel spoil pile at the Hawkins Creek crossing) and the Iron Canyon tunnel;

The area within a 200-ft radius buffer of the Iron Canyon surge chamber, James B. Black, Pit 6 and Pit 7 powerhouses and a 200-ft buffer off of the entire length of the James B. Black penstock and the Willow Creek siphon;

A 200-ft buffer (*i.e.*, 100 ft on either side of centerline) off of the following transmission lines: James B. Black, Pit 6, Pit 7, and the above-ground portion of the 12-kV line between James B. Black Powerhouse and Iron Canyon Dam;

A 200-ft buffer (*i.e.*, 100 ft on either side of the centerline) off of the perimeter road around Iron Canyon Reservoir;

A 200-ft buffer (*i.e.*, 100 ft on either side of centerline) off of Oak Mountain, Pit 6 and Pit 7 roads;

Pit 7 Afterbay Project roads down to the high-water mark on the Pit River, subject to areas between the road and the high-water mark exhibiting human disturbance as noted

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above for Iron Canyon Reservoir, including a 200-ft buffer (*i.e.*, 100 ft on either side of centerline) off of the road; and

The area within a 200-ft radius of the Gage MC-1 enclosure at Ah-Di-Na Campground and the Gage MC-10 on Iron Canyon Creek and a 200-ft buffer off of the associated Gage MC-10 access road downstream of Iron Canyon Dam (*i.e.*, 100 ft on either side of centerline).

Following the 2007 special-status plant, lichen, and fungi surveys, inventories completed for the traffic study (RL-S6) identified roads deemed to be "Project-affected" (see TM-55, *Road Condition Inventory* [PG&E 2009]), and surveys completed for the dispersed recreation study (RL-S2) located specific dispersed recreation sites (see TM-16, *Data Summary for Developed and Dispersed Recreation Inventory* [PG&E 2008)]. A second phase of special-status and special-interest plant, lichen, and fungi surveys was conducted in 2008 to survey those identified roads and dispersed recreation sites that had not already been surveyed in 2007 and that were not on private property (Figure 4). Additionally, during 2009 a parcel of National Forest System (NFS) land at the Claiborne Creek confluence was surveyed; it had not been surveyed in 2008 due to access issues but was able to be surveyed in 2009 via helicopter transportation to the site.

Table 1 and Figures 5–6 identify all dispersed recreation sites, including those that overlapped with 2007 surveys, those that were surveyed in 2008 and 2009, and those that were not surveyed because they were on private property. Ultimately, the following areas associated with dispersed recreation and Project-affected roads were surveyed in the Spring and Summer of 2008 or 2009:

A 200-ft corridor centered on the access road between Iron Canyon Spillway and Kosk Creek;

McCloud Reservoir dispersed recreation sites;

McCloud Dam to Hawkins Tunnel dispersed recreation sites;

Lower McCloud River recreation dispersed sites;

Iron Canyon Reservoir dispersed recreation sites;

James B. Black Powerhouse dispersed recreation sites;

Pit 7 Afterbay dispersed recreation sites; and

NFS land at Claiborne Creek.

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Table 1. Dispersed recreation sites

Location[a]		Survey Year[b]	Dispersed Recreation Site Name[c]
McCloud Reservoir Recreation Sites	McCloud Reservoir	2007	MP 1, MP 5B, MP 5C, MP 7A, MP 9A, MP 11A, MP 11B
		Not Surveyed (Private Property)	MP 3, MP 6A, MP 6B, MP 8, MP 9B MP IA, MP IB, MP IC, MP 5A Hawkins Tunnel 4D, Hawkins Tunnel 4E
	McCloud Dam to Hawkins Tunnel	2008	Ash Camp put-in, Hawkins Tunnel 4A, Near Gage MC-7, MP 2, MP 10
		2007	Access to Ah-Di-Na CG
	Lower McCloud River	2008	Access to/from TNC parking, Bald Mountain corner, LMR 1A, LMR 1B, LMR 1C, LMR 2A, LMR 2B, LMR 3A
		2007	Claiborne Creek
National Forest System land at Claiborne Creek confluence		2008 2009	ICR 12A, ICR 12B, ICR 13A, ICR 13B, ICR 13C, ICR 14A, ICR 14B, ICR 14C, ICR 15, ICR 16 E1, ICR 16 E2, ICR 16 E3, ICR 16 E4, ICR 17 W1, ICR 17 W2, ICR 7BB, ICR 8A, ICR 8B, ICR D1A, ICR D1B, ICR D2B, ICR D2C, ICR D3-1, ICR D3-2A, ICR D3-2B, ICR D3-2D, ICR LR0A, ICR LR0B, ICR LR0C, ICR LR0D, ICR LR0E, ICR LR0F, ICR LR1A, ICR LR1B, ICR LR1C, ICR LR2A, ICR LR2B, ICR LR2C, ICR LR2D, ICR LR2E, ICR LR2F, ICR LR2G, ICR LR2H, ICR LR2I, ICR LR2J, ICR LR2K, ICR LR2L, ICR LR2M, ICR LR3A, ICR LR3B, ICR LR3C, ICR LR3D, ICR LR3E, ICR LR3F, ICR LR3H, ICR LR3I, ICR LR3J, ICR LR3K, ICR LR3L, ICR LR4A, ICR LR4B, ICR LR4C, ICR LR4D, ICR LR4E, ICR LR4F, ICR LR5A, ICR LR5B, ICR LR5C, ICR LR5D, ICR LR5E, ICR LR5F, ICR LR5G, ICR LR5H, ICR LR5I, ICR LR6A, ICR LR6B, ICR LR6C, ICR LR6D, ICR LR6E, ICR LR6F, ICR LR6G, ICR LR6H, ICR LR6I, ICR LR6J, ICR LR6K, ICR LR6L, ICR LR6M, ICR LR6N, ICR LR6O, ICR LR6P, ICR LR7A, ICR LR7AA, ICR LR7B, ICR LR7C, ICR LR7D, ICR LR7E, ICR LR7F, ICR LR7G, ICR LR7K, ICR LR7L, ICR LR7M, ICR LR7N, ICR LR7O, ICR
Iron Canyon Reservoir Recreation Sites		2007	ICR D2A, ICR D2D, ICR LR11A, ICR LR11B, ICR LR11C, ICR LR11D, ICR LR2F, ICR
		2008	LR9A, ICR LR9B, ICR LR9C, ICR LR9E, ICR LR9F

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Location[a]	Survey Year	Dispersed Recreation Site Name[c]
James B. Black Powerhouse Recreation Sites	2008	JBB 1A, JBB 1B, JBB 1C, JBB 1D, JBB 1E, JBB 1G, JBB 1H, JBB 1I, JBB 2A, JBB 2B, JBB 2C, JBB 3A
Pit 6 Dam Recreation Sites	2007	Pit 6 R1
Pit 7 Afterbay Recreation Sites	2007	Fenders 1A, Fenders 1B, Fenders 2A, Fenders 3A, Fenders 3B, Fenders 4A, Fenders 4B, Fenders 9A, Fenders 9C, Fenders 10, Fenders 11, Fenders D5, Pit 7 5 Dam 1, Pit 7 5 Dam 2, Pit 7 5 Dam 3, Pit 7 5 Dam 4, Pit 7 Afterbay 5, Pit 7 Afterbay 8
	2008	Pit 7 Afterbay 6, Pit 7 Afterbay 7

[a] For site locations, see Figures 5–6.

[b] For recreation sites surveyed in 2007, the data is included in the original survey area (*e.g.*, for MP1 site, data is included in 2007 McCloud Reservoir Road data, not 2008 McCloud Reservoir dispersed recreation data).

[c] Site names are those identified in TM-16 (PG&E 2008).

Finally, the following areas associated with proposed new construction areas were surveyed in the Spring and Summer of 2008 (Figures 7–8):

A 200-ft buffer around the proposed McCloud Powerhouse site at the base of McCloud Dam;

A 66-ft corridor centered on the proposed McCloud transmission line route, corresponding to the existing road right-of-way (additional pre-construction surveys will be conducted as necessary when the final transmission line route is identified);

A 200-ft corridor centered on the proposed Pit 7 Afterbay Transmission Line route;

A 200-ft buffer around the proposed excavation and construction areas for the Pit 7 Afterbay Powerhouse on the west side of the Pit 7 Afterbay Weir; and,

A 200-ft corridor centered on the proposed location of the access road to the Pit 7 Afterbay Powerhouse.

A portion of the proposed new construction areas overlapped with 2007 survey areas and were not resurveyed in 2008. However, survey data for each proposed new construction area includes both sets of 2007 and 2008 data.

Specifically excluded from the Study Area were areas where access is unsafe (very steep terrain or high water flows) or private property for which Licensee has not received specific approval from the landowner to enter the property and perform the study. The Licensee made a good faith effort to obtain private property access for this study.

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3 METHODS

Surveys associated with existing Project facilities, dispersed recreation sites, Project-affected roads, and proposed new construction areas were conducted in Spring and Summer of 2007, 2008, and 2009. All surveys were consistent with generally accepted methods for conducting floristic surveys in California and follow the special-status plant, lichen, and fungi survey techniques used by federal and state agencies that manage public lands within the Project Vicinity (California Department of Fish and Game [CDFG] 2000).

3.1 EstablishingtheListsofTargetSpecies

3.1.1 Special-status Plant, Lichen and Fungi

The list of target survey species (*i.e.*, special-status species for which habitat exists within the Project and distributional range is appropriate) was first developed during the literature review conducted for the PAD (PG&E 2006). In Winter and Spring of 2007, and again in Spring 2008, each of the following resources was queried to refine the target list:

The U.S. Fish and Wildlife (USFWS) list of federally listed and proposed endangered and threatened species (USFWS 2007 and 2008);

The CNPS online Inventory of Rare and Endangered Vascular Plants of California (CNPS 2006 and 2008);

CDFG's California Natural Diversity Database (CNDDB) (CDFG 2006 and 2008);

The most current list (October 6, 2006) of plants considered by the Shasta-Trinity National Forest as sensitive or special-interest (USFS 2006; personal communication, J. Nelson, District Botanist, USFS, Redding, CA and Megan Keever, Botanist, Stillwater Sciences, Berkeley, CA, March 21, 2008);

The most current list of Survey and Manage species in the Northwest Forest Plan (USFS 2006); and

A current list of plants considered by the BLM as sensitive (BLM 2006 and 2007).

Database queries (*i.e.*, the USFWS, CNPS and CNDDB databases) were based on a search of the USGS 7.5' quadrangle on which a particular Study Area site is located, and the surrounding eight quadrangles. The quadrangles searched for each of the sites in the Study Area are tabulated in Table 2. A synthesis of all queries is included as Attachment 1.

To ascertain if species identified in the queries were likely to occur within the Study Area, habitat preferences for each species were compared with detailed Project description information from the PAD. Additionally, Julie Nelson of the Shasta-Trinity National Forest was consulted (personal communication, J. Nelson, District Botanist, USFS, Redding, CA, and Nicole Jurjavcic, Botanist, Stillwater Sciences, Berkeley, CA, February 16, 2007; personal communication, J. Nelson, District Botanist, USFS, Redding, CA, and Megan Keever, Botanist, Stillwater Sciences, Berkeley, CA, April 30, 2008) to discuss potential species presence. Tables 3 through 6 are the finalized target lists for both vascular and non-vascular species based on the literature and database reviews, and discussions with agency staff.

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Table 2. List of quadrangles queried for special-status plants by Study Area sites

Study Area Sites	Main Quadrangle	Adjacent Quadrangles
Iron Canyon Reservoir Iron Canyon Tunnel Gage MC-10 Oak Mountain Road Iron Canyon Spillway to Kosk Creek Road Iron Canyon Reservoir Recreation Sites Pit 7 Afterbay Dam Pit 7 Afterbay and Associated Areas	Big Bend (680C)	Shoeinhorse Mountain (681D), Goose Gap (664A), Roaring Creek (663B), Chalk Mountain (663A), Skunk Ridge (680D), Dead Horse Summit (680A), Grizzly Peak (680B), Lake McCloud (681A)
Pit 7 Afterbay Recreation Sites Pit 7 Road Proposed Pit 7 Afterbay Powerhouse, Proposed Access Road to Pit 7 Afterbay Powerhouse, and Proposed Pit 7 Afterbay Transmission Line McCloud Reservoir: Proposed McCloud Transmission Line	Devils Rock (664D)	Minnesota Mountain (664C), Bella Vista (646B), Oak Run (646A), Whitmore (645B), Montgomery Creek (663C), Roaring Creek (663B), Goose Gap (664A), Bolibokka Mountain (664B)
	Elk Spring (698D)	Lake McCloud (681A), Girard Ridge (681B), Rainbow Mountain (697B), Kinyon (697C), Grizzly Peak (680B), Ash Creek Butte (698A), Mount Shasta (698B), McCloud (698C)
McCloud Reservoir: Proposed McCloud Transmission Line	Girard Ridge (681B)	McCloud (698C), Elk Spring (698D), Dunsmuir (682A), Tombstone Mountain (682D), City Of Mount Shasta (699D), Lake Mccloud (681A), Yellowjacket Mountain (681C), Shoeinhorse Mountain (681D)
McCloud Reservoir: Proposed McCloud Transmission Line	McCloud (698C)	Elk Spring (698D), Ash Creek Butte (698A), Mount Shasta (698B), Hotlum (699A), City of Mount Shasta (699D), Dunsmuir (682A), Girard Ridge (681B), Lake McCloud (681A)
McCloud Reservoir and Perimeter McCloud Reservoir: Proposed McCloud Transmission Line McCloud Reservoir Recreation Sites	Lake McCloud (681A)	Girard Ridge (681B), Yellowjacket Mountain (681C), Shoeinhorse Mountain (681D), Big Bend (680C), Grizzly Peak (680B), Kinyon (697C), Elk Spring (698D) McCloud (698C)
Pit 7 Dam	Montgomery Creek	Devils Rock (664D), Oak Run (646A), Whitmore

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Study Area Sites	MainQuadrangle	Adjacent Quadrangles
Pit 7 Powerhouse Pit 7 Transmission Line Pit 7 Road Proposed Pit 7 Afterbay Powerhouse, Proposed Access Road to Pit 7 Afterbay Powerhouse, and Proposed Pit 7 Afterbay Transmission Line	(663C)	(645B), Miller Mountain (645A), Hatchet Mountain Pass (663D), Chalk Mountain (663A), Roaring Creek (663B), Goose Gap (664A)
James B. Black Powerhouse James B. Black Transmission Line 12 KV Line Pit 6 Dam Pit 6 Powerhouse Pit 6 Powerhouse Road Pit 6 Transmission Line James B. Black Powerhouse	Roaring Creek (663B)	Goose Gap (664A), Devils Rock (664D), Montgomery Creek (663C), Hatchet Mountain Pass (663D), Chalk Mountain (663A), Skunk Ridge (680D), Big Bend (680C), Shoeinhorse Mountain (681D)
Recreation Sites Iron Canyon Reservoir McCloud Tunnel Gage MC-1 McCloud Reservoir: Proposed McCloud Transmission Line Lower McCloud River Recreation Sites	Shoeinhorse Mountain (681D)	Yellowjacket Mountain (681C), Bolibokka Mountain (664B), Goose Gap (664A), Roaring Creek (663B), Big Bend (680C), Grizzly Peak (680B), Lake McCloud (681A), Girard Ridge (681B)
McCloud Dam to Hawkins Bald Mountain corner Tunnel Recreation Sites	Yellowjacket Mountain (681C)	Shoeinhorse Mountain (681D), Goose Gap (664A), Girard Ridge (681B), Bolibokka Mountain (664B), Tombstone Mountain (682D), Dunsmuir (682A), Hanland Peak (665A), Lake Mccloud (681A)

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Table 3. Special-status vascular plants potentially occurring in the Study Area

Scientific Name	Common Name	Status Federal/ State/CNPS/ USFS/ BLM	Blooming Period[a]	Elevation Range m (ft)[a]	Habitat Associations[a]
Ageratina shastensis	Shasta eupatory; Shasta ageratina	–/–/List 4.2/FSE/–	Jun–Oct	400–1,800 (1,312–5,906)	Chaparral, lower montane, coniferous forest on rocky, carbonate soils
Agrostis hendersonii	Henderson's bent grass	–/–/List 3.2/– /–	Apr–May	70–305 (230–1,001)	Mesic valley and foothill grassland; vernal pools
Anisocarpus scabridus (*Raillardiopsis scabrida* in theJepsonManual[Hickman 1993])	Scabrid alpine tarplant	–/–/List 1B.3/FSS/BLMS	Jul–Aug	1,650–2,300 (5,413–7,546)	Upper montane coniferous forest on metamorphic, rocky soils
Arnica venosa	Veiny arnica; Shasta County arnica	–/–/List 4.2/FSE/–	May–Jul	400–1,490 (1,312–4,888)	Cismontane woodland; lower montane coniferous forest; often in disturbed areas including roadcuts
Asarum marmoratum	Marbled wild-ginger	–/–/List 2.3/–/–	Apr–Aug	200–1,800 (656–5,906)	Lower montane coniferous forest
Botrychium crenulatum	Scalloped moonwort	–/–/List 2.2/FSS/–	Jun–Sep	1,268–3,280 (4,160–10,761)	Bogs andfens; freshwater marshes and swamps; lower montane coniferousforest; meadows and seeps
Botrychium minganense	Mingan moonwort	–/–/List 2.2/FSS/–	Jul–Sep	1,500–2,055 (4,921–6,742)	Bogs andfens; lower montane coniferousforest; mesic upper montaneconiferous forest
Botrychium pinnatum	Northwestern moonwort	–/–/List 2.3/FSS/–	Jul–Oct	1,770–2,040 (5,807–6,693)	Lower montane coniferous forest; meadowsand seeps; mesic upper montaneconiferous forest
Botrychium virginianum	Rattlesnake fern	–/–/List 2.2/FSS/–	Jun–Sep	730–1,300 (2,395–4,265)	Bogs andfens; mesic lower montaneconiferous forest; meadowsand seeps; riparian forest

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Scientific Name	Common Name	Status Federal/ State/CNPS/ USFS/ BLM	Blooming Period[a]	Elevation Range m (ft) [a]	Habitat Associations[a]
Calochortus greenei	Greene's mariposa lily	–/–/List 1B.2/FSS/BLMS	Jun–Aug	1,035–1,890 (3,396–6,201)	Cismontane woodland; meadows and seeps; pinyon and juniper woodland; upper montane coniferous forest on volcanic soils
Calochortus longebarbatus var. *longebarbatus*	Long-haired star-tulip	–/–/List 1B.2/FSS/BLMS	Jun–Aug	1,005–1,900 (3,297–6,234)	Great basin scrub; openings and drainages in lower montane coniferous forest; meadows and seeps; mesic vernal pools on clay soils
Calochortus syntrophus	Callahan's mariposa lily	–/–/List 3.1/– /–	May–Jun	525–886 (1,722–2,907)	Cismontane woodland; lower montane coniferous forest; vernally mesic valley and foothill grasslands
Calystegia atriplicifolia ssp. *buttensis*	Butte County morning-glory	–/–/List 1B.2/FSS/BLMS	May–Jul	600–1,524 (1,969–5,000)	Chaparral; lower montane coniferous forest on rocky soils; roadsides
Campanula shetleri	Castle Crags harebell	–/–/List 1B.3/FSS/BLMS	Jun–Sep	1,220–1,830 (4,003–6,004)	Lower montane coniferous forest on rocky soils
Campanula wilkinsiana	Wilkin's harebell; Wilken's bellflower	–/–/List 1B.2/FSS/–	Jul–Sep	1,525–2,600 (5,003–8,530)	Meadows and seeps; subalpine coniferous forest; upper montane coniferous forest
Carex comosa	Bristly sedge	–/–/List 2.1 /–/–	May–Sep	0–625 (0–2,051)	Coastal prairie; marshes, swamps and lake margins; valley and foothill grassland
Carex inops ssp. *inops*	Long-stoloned sedge	–/–/List 3.3 /–/–	Apr–Jul	680–2,000 (2,231–6,562)	Lower montane coniferous forest on rocky soils
Carex klamathensis[b]	Sedge	–/–/List 1B.2 /FSS/–	Not enough information	1000–1,140 (3,281–3,740)	Chaparral, cismontane woodland, and serpentinite meadows and seeps

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Scientific Name	Common Name	Status Federal/ State/CNPS/ USFS/ BLM	Blooming Period[a]	Elevation Range m (ft) [a]	Habitat Associations[a]
Carex lasiocarpa	Slender sedge	–/–/List 2.3 /–/–	Jun–Jul	1,800–2,100 (5,906–6,890)	Bogs and fens; marshes and swamps; freshwater lake margins
Castilleja miniata ssp. *elata*	Siskiyou Indian paintbrush	–/–/List 2.2 /–/–	May–Aug	0–1,750 (0–5,741)	Bogs and fens; seeps in lower montane coniferous forest; often on serpentinite substrate
Chaenactis douglasii var. *alpina*	Alpine dusty maidens	–/–/List 2.3 /–/–	Jul–Sep	3,000–3,400 (9,843–11,155)	Alpine boulder and rock field; granitic soils
Chaenactis suffrutescens	Shasta chaenactis	–/–/List 1B.3/FSS/BLMS	May–Sep	760–2,800 (2,493–9,186)	Lower montane coniferous forest; upper montane coniferous forest on sandy or serpentinite substrate
Clarkia borealis ssp. *arida*	Shasta clarkia	–/–/List 1B.1/–/BLMS	Jun–Aug	490–595 (1,608–1,952)	Cismontane woodland; gaps in lower montane coniferous forest
Clarkia borealis ssp. *borealis*	Northern clarkia	–/–/List 1B.3/FSS/BLMS	Jun–Sep	400–1,340 (1,312–4,396)	Chaparral; cismontane woodland; lower montane coniferous forest
Collomia larsenii	Talus collomia	–/–/List 2.2/FSS/–	Jul–Sep(Oct)	2,210–3,500 (7,251–11,483)	Alpine boulder and rock field; closed-cone coniferous forest; subalpine coniferous forest; upper montane coniferous forest on volcanic talus
Cordylanthus tenuis ssp. *pallescens*	Pallid bird's-beak	–/–/List 1B.2/FSS/BLMS	Jul–Sep	695–1,645 (2,280–5,397)	Lower montane coniferous forest on gravelly, volcanic alluvium
Cypripedium fasciculatum	Clustered lady's-slipper	–/–/List 4.2/FSS, SM/BLMS	Mar–Aug	100–2,435 (328–7,989)	Lower montane coniferous forest; North Coast coniferous forest; serpentinite seeps and streambanks
Cypripedium montanum	Mountain lady's-slipper	–/–/List 4.2/FSS, SM /BLMS	Mar–Aug	185–2,225 (607–7,300)	Broadleafed upland forest; cismontane woodland; lower montane coniferous forest; North Coast coniferous forest

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Scientific Name	Common Name	Status Federal/ State/CNPS/ USFS/ BLM	Blooming Period[a]	Elevation Range m (ft)[a]	Habitat Associations[a]
Draba carnosula	Mt. Eddy draba	–/–/List 1B.3/FSS/–	Jul–Aug	1,935–3,000 (6,348–9,843)	Subalpine coniferous forest; upper montane coniferous forest on serpentinite, rocky soils
Epilobium oreganum	Oregon fireweed; Grant's Pass willowherb	–/–/List 1B.2/FSS/BLMS	Jun–Sep	500–2,240 (1,640–7,349)	Bogs and fens; lower montane coniferous forest; mesic, upper montane coniferous forest
*Eriastrum tracyi (E. brandegeea*einthe Jepson Manual[Hickman 1993])	Brandegee's eriastrum; Tracy's eriastrum; Brandegee's wooly-star	–/CR/List 1B.2/FSS/BLMS	Apr–Aug	305–1,030 (1,001–3,379)	Chaparral; cismontane woodland on volcanic and sandy soils
Eriogonum alpinum	Trinity buckwheat	–/CE/List 1B.2/FSS/–	Jun–Sep	2,185–2,900 (7,169–9,514)	Alpine boulder and rock field; subalpine coniferous forest; upper montane coniferous forest on serpentinite and rocky soils
Eriogonum pyrolifolium var. *pyrolifolium*	Pyrola-leaved buckwheat	–/–/List 2.3/– /–/	Jul–Sep	1,675–3,200 (5,495–10,499)	Alpine boulder and rock field on sandy or gravelly, pumice substrate
Eriogonum ursinum var. *erubescens*	Sulphurflower buckwheat; blushing wild buckwheat	–/–/List 1B.3/FSS/BLMS	Jun–Sep	1,600–1,900 (5,249–6,234)	Chaparral montane; lower montane coniferous forest on rocky, scree, or talus substrate
Erythronium citrinum var. *roderickii*	Scott Mountains fawn lily; Roderick's fawn lily	–/–/List 1B.3/FSS/BLMS	Mar–Jun	650–1,460 (2,133–4,790)	Lower montane coniferous forest on serpentinite soils
Erythronium klamathense	Klamath fawn lily	–/–/List 2.2 /–/–	Apr–Jul	1,200–1,850 (3,937–6,070)	Meadows and seeps; upper montane coniferous forest
Fritillaria eastwoodiae	Butte County fritillary	–/–/List 3.2/FSS/–	Mar–May	50–1500 (164–4921)	Chaparral; cismontane woodland; openings in lower montane coniferous forest; sometimes on serpentinite soils
Geum aleppicum	Aleppo avens	–/–/List 2.2/– /–	Jun–Aug	450–1,500 (1,476–4,921)	Great Basin scrub; lower montane coniferous forest; meadows and seeps

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Scientific Name	Common Name	Status Federal/ State/CNPS/ USFS/ BLM	Blooming Period[a]	Elevation Range m (ft) [a]	Habitat Associations[a]
Harmonia doris-nilesiae	Niles's harmonial; Nile's madia	–/–/List 1B.1/FSS/BLMS	May–Jul	650–1,660 (2,133–5,446)	Chaparral; cismontane woodland; openings in lower montane coniferous forest on rocky soils, usually serpentinite
Harmonia stebbinsii	Stebbins's harmonia; Stebbin's madia	–/–/List 1B.1/FSS/BLMS	May–Jun	400–1,580 (1,312–5,184)	Chaparral; lower montane coniferous forest on serpentinite soils
Howellia aquatilis	Water howellia	FT/–/List 2.2/FSS/–	Jun	1,085–1,290 (3,560–4,232)	Freshwater marshes and swamps
Hulsea nana	Little hulsea	–/–/List 2.3/– /–	Jul–Aug	1,720–3,355 (5,643–11,007)	Alpine boulder and rock field; subalpine coniferous forest on rocky or gravelly, volcanic soils
Hymenoxys lemmonii	Alkali hymenoxys	–/–/List 2.2/– /–	Jun–Aug	240–1,000 (787–3,281)	Great Basin scrub, lower montane coniferous forest, and subalkaline meadows and seeps
Iliamna bakeri	Baker's globe mallow	–/–/List 4.2/FSS, SM/BLMS	Jun–Sep	1,000–2,500 (3,281–8,202)	Chaparral; Great Basin scrub; openings in lower montane coniferous forest; pinyon and juniper woodland on volcanic soils, often in burned areas
Iliamna latibracteata	California wild hollyhock; California globe mallow	–/–/List 1B.2/FSS/–	Jun–Aug	60–2,000 (197–6,562)	Montane chaparral; lower montane coniferous forest; mesic, North Coast coniferous forest; riparian scrub; often in burned areas
Ivesia longibracteata	Castle Crags ivesia	–/–/List 1B.3/FSS/BLMS	Jun	1,200–1,400 (3,937–4,593)	Lower montane coniferous forest on granitic, rocky soils
Ivesia pickeringii	Pickering's ivesia	–/–/List 1B.2/FSS/BLMS	Jun–Aug	800–1,510 (2,625–4,954)	Lower montane coniferous forest; mesic meadows and seeps, usually serpentinite soils

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Scientific Name	Common Name	Status Federal/ State/CNPS/ USFS/ BLM	Blooming Period[a]	Elevation Range m (ft) [a]	Habitat Associations[a]
Juncus digitatis[b]	Rush	–/–/–/Of Interest/–	Not enough information	670–760 (2,198–2,493)	Cedar ponderosa mixed forest or oak/mixed scrub; sandy, gravelly clay soils; near springs, in vernally moist areas[c]
Leptosiphon nuttallii ssp. *howellii*	Mt. Tedoc linanthus; Mt. Tedoc leptosiphon	–/–/List 1B.3/FSS/–	May–Aug	1,220–2,800 (4,003–9,186)	Lower montane coniferous forest on serpentinite soils
Lewisia cantelovii	Cantelow's lewisia; wet cliff lewisia	–/–/List 1B.2/FSS/BLMS	May–Oct	330–1,370 (1,083–4,495)	Broadleafed upland forest; chaparral; cismontane woodland; mesic, lower montane coniferous forest; granitic and sometimes serpentinite seeps
Lewisia cotyledon var. *howellii*	Howell's lewisia	–/–/List 3.2/– /–	Apr–Jul	150–2,010 (492–6,594)	Broadleafed upland forest; chaparral; cismontane woodland; lower montane coniferous forest on rocky soils
Limnanthes floccosa ssp. *bellingeriana*	Bellinger's meadowfoam	–/–/List 1B.2/– /BLMS	Apr–Jun	290–1,100 (951–3,609)	Cismontane woodland; mesic meadows and seeps
Lomatium peckianum	Peck's lomatium	–/–/List 2.2/– /–	Apr–May (Jun)	700–1,800 (2,297–5,906)	Chaparral, Cismontane woodland, Lower montane coniferous forest, Pinyon and juniper woodland/volcanic
Lupinus elmeri	Greene Elmer's lupine; South Fork Mountain lupine	–/–/List 1B.2/FSS, SM/–	Jun–Jul	1,370–2,000 (4,495–6,562)	Lower montane coniferous forest
Minuartia rosei	Peanut stitchwort; peanut sandwort	–/–/List 4.2/FSS/–	May–Jul	750–1,525 (2,461–5,003)	Lower montane coniferous forest on serpentinite soils
Minuartia stolonifera	Stolon sandwort; Scott Mountain sandwort	–/–/List 1B.3/FSS/BLMS	May–Aug	1,250–1,400 (4,101–4,593)	Lower montane coniferous forest on serpentinite soils

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Scientific Name	Common Name	Status Federal/ State/CNPS/ USFS/ BLM	Blooming Period[a]	Elevation Range m (ft) [a]	Habitat Associations[a]
Montia howellii	Howell's montia	–/–/List 2.2/FSS/BLMS	Mar–May	0–730 (0–2,395)	Meadows and seeps; North Coast coniferous forest; mesic vernal pools
Neviusia cliftonii	Shasta snow wreath; California snow wreath	–/–/List 1B.2/FSS/BLMS	Apr–Jun	300–500 (984–1,640)	Cismontane woodland; lower montane coniferousforest;riparian woodland, often streamsides; sometimes carbonate, volcanic, or metavolcanic soils
Ophioglossum pusillum	Northern adder's-tongue	–/–/List 2.2/FSS/–	Jul	1,000–2,000 (3,281–6,562)	Margins of marshes and swamps; mesic valley and foothill grassland
~~*Orcuttia tenuis*~~	~~Slender orcutt grass~~	~~FT/CE/List 1B.1/FSS/BLMS~~	~~May–Sep(Oct)~~	~~35–1,760 (115–5,774)~~	~~Vernalpools~~
~~*Orthocarpus pachystachyus*~~	~~Shasta orthocarpus~~	~~–/–/List 1B.1/–/BLMS~~	~~May~~	~~840–850 (2,756–2,789)~~	~~Great Basin scrub, meadows and seeps, valley and foothill grassland~~
Parnassia cirrata var. *intermedia (Parnassia cirrata* in the Jepson Manual [Hickman 1993])	Grass-of-Parnassus; fringed grass of Parnassus	–/–/List 2.2/FSS/BLMS	Jul–Sep	780–1,980 (2,559–6,496)	Bogs and fens; meadows and seeps; rocky, serpentine soil
Penstemon filiformis	Thread-leaved beardtongue	–/–/List 1B.3/FSS/BLMS	May–Jul (Sep)	450–1,830 (1,476–6,004)	Cismontane woodland; lower montane coniferous forest on rocky soils
Phacelia cookei	Cooke's phacelia	–/–/List 1B.1/FSS/BLMS	Jun–Jul	1,095–1,700 (3,593–5,577)	Great Basin scrub; lower montane coniferous forest on sandy or volcanic soils
Phacelia dalesiana	Scott Mountain phacelia	–/–/List 4.3/–/–	May–Jul	1025–2,105 (3,363–6,906)	Lower montane coniferous forest, meadows and seeps, subalpine coniferous forest, and serpentinite soils in upper montane coniferous forest

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Scientific Name	Common Name	Status Federal/ State/CNPS/ USFS/ BLM	Blooming Period[a]	Elevation Range m (ft) [a]	Habitat Associations[a]
Phacelia greenei	Scott Valley phacelia	–/–/List 1B.2/FSS/BLMS	Apr–Jun	800–2,440 (2,625–8,005)	Closed-cone coniferous forest; lower montane coniferous forest; subalpine coniferous forest; upper montane coniferous forest on serpentinite soils
Picea engelmannii	Engelmann spruce	–/–/List 2.2/– /–	N/A	1,065–2,135 (3,494–7,005)	Upper montane coniferous forest Bogs and fens, often serpentinite
Pinguicula vulgaris ssp. *macroceras*	Horned butterwort	–/–/List 2.2/– /–	Apr–Jun	40–1,920 (131–6,299)	Alpine boulder and rock field; subalpine coniferous forest on rocky, serpentinite, granitic, or volcanic soils
Polemonium chartaceum	Mason's sky pilot	–/–/List 1B.3/FSS/–	Jun–Aug	1,800–4,200 (5,906–13,780)	Mineralized meadows and seeps
Puccinellia howellii	Howell's alkali grass	–/–/List 1B.1/FSS, SM/BLMS	Apr–Jun	490–490 (1,608–1,608)	Bogs and fens; meadows and seeps; mesic, upper montane coniferous forest on serpentinite soils
Raillardella pringlei	Showy raillardella	–/–/List 1B.2/FSS/BLMS	Jul–Sep	1,200–2,290 (3,937–7,513)	Meadows and seeps; pinyon and juniper woodland; mesic playas
Rorippa columbiae	Columbia yellow cress	–/–/List 1B.2/FSS/BLMS	May–Sep	1,200–1,800 (3,937–5,906)	Lower montane coniferous forest, mesic meadows and seeps, marshes and swamps
Scutellaria galericulata	Marsh skullcap	–/–/List 2.2/–/–	Jun–Sep	0–2,100 (0–6,890)	Broadleaved upland forest; chaparral; lower montane coniferous forest; subalpine coniferous forest on granitic, rocky soils
Sedum paradisum	Canyon Creek stonecrop	–/–/List 1B.3/FSS/BLMS	May–Jun	300–1,860 (984–6,102)	

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Scientific Name	Common Name	Status Federal/ State/CNPS/ USFS/ BLM	Blooming Period[a]	Elevation Range m (ft) [a]	Habitat Associations[a]
Silene campanulata ssp. *campanulata*	Red Mountain catchfly	–/CE/List 4.2/FSS, SM /BLMS	Apr–Jul	425–2,085 (1,394–6,841)	Chaparral; lower montane coniferous forest, usually on rocky serpentinite soils
Silene occidentalis ssp. *longistipata*	Long-stiped campion	–/–/List 1B.2/FSS/BLMS	Jun–Aug	1,000–2,000 (3,281–6,562)	Chaparral; lower montane coniferous forest; upper montane coniferous forest
Silene salmonacea[b]	Klamath Mountain catchfly	–/–/List 1B.2/FSS/–	Jun	775–1,045 (2,543–3,429)	Lower montane coniferous openings; often serpentenite
Silene suksdorfii	Cascade alpine campion	–/–/List 2.3/– /–	Jul–Sep	2,355–3,110 (7,726–10,203)	Alpine boulder and rock field; subalpine coniferous forest; upper montane coniferous forest on volcanic, rocky soils
Smilax jamesii	English Peak greenbriar	–/–/List 1B.3/FSS/BLMS	May–Jul (Aug)	580–2,500 (1,903–8,202)	Broadleafed upland forest; lower montane coniferous forest; marshes and swamps; North Coast coniferous forest; upper montane coniferous forest on streambanks and lake margins
Streptanthus longisiliquus[b]	long-fruit jewel-flower	–/–/List 4.3/FSS/–	Apr–Sep	715–1,500 (2,346–4,921)	Cismontane woodland and openings in lower montane coniferous forest
Swertiaumpquaensis (Fraseraumpquaensis in the JepsonManual[Hickman 1993])	Umpqua swertia; Umpqua green gentian	–/–/List 2.2/FSS/–	Jun–Jul	1,555–1,900 (5,102–6,234)	Chaparral; lower montane coniferous forest; meadows and seeps; North Coast coniferous forest Mesic meadows and seeps
Trifoliumsiskiyouense	Siskiyou clover	–/–/List 3.2/–/–	Jun-Jul	880–1,500 (2,887–4,921)	Rocky supalpine coniferous forest
Vacciniumscoparium	Little-leaved huckleberry	–/–/List 2.2/–/–	Jun–Aug	1,036–2,200 (3,399–7,218)	

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Scientific Name	Common Name	Status Federal/ State/CNPS/ USFS/ BLM	Blooming Period[a]	Elevation Range m (ft)[a]	Habitat Associations[a]
Vibernum edule	Squashberry	–/–/–/Of Interest/–	Late spring	300–900 (980–2,950)	Chaparral,yellowpineforest [d]
Viburnum ellipticum	Oval-leaved viburnum	–/–/List 2.3/– /–	May–Jun	215–1,400 (705–4,593)	Chaparral; cismontane woodland; lower montane coniferous forest

Notes: Federal – Federal Endangered Species Act
FT – Federally listed threatened
State – California Endangered Species Act
CE – State endangered
CNPS – California Native Plant Society
List 1B – Rare, threatened, or endangered in CA and elsewhere
List 2 – Rare, threatened, or endangered in CA but common elsewhere
List 3 – We need more information about this plant (Review List)
List 4 – Limited Distribution (Watch List)
0.1 Seriously endangered in CA
0.2 Fairly endangered in CA
0.3 Not very endangered in CA
USFS – United States Forest Service
FSS – Forest Service Sensitive
FSE – Forest Service Endemic
SM – Northwest Plan Survey and Manage List
BLM – Bureau of Land Management
BLMS – BLM Sensitive species

[a] CNPS (2008)

[b] Personal communication, J. Nelson, District Botanist, USFS, Redding, CA, and M. Keever, Botanist, Stillwater Sciences, Berkeley, CA, March 21, 2008.

[c] Personal communication, J. Nelson, District Botanist, USFS, Redding, CA, and N. Jurjavcic, Botanist, Stillwater Sciences, Berkeley, CA, June 8, 2007.

[d] Rosatti (2008)

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Table 4. Special-status lichens potentially occurring in the Study Area

Scientific Name	Common Name	Status Federal/ State/ USFS/BLM	Elevation Range m (ft)[a]	Habitat Associations[a]
Hydrothyria venosa (*Peltigera hyrothyria* in Lichensof California [Hale and Cole 1988])	Veined water lichen	–/–/FSS/–	1,524–2,133 (5,000–7,000)	On stones or gravel submerged or partially submerged in small streams in Montane and Subalpine Forest
Leptogium siskiyouensis	Skin lichen	–/–/–/Of Interest/–	396–1,463 (1,300–4,800)	Epiphytic on the smooth bark of young oak trunks or oak branches, particularly *Quercus kelloggii*. It has also been found in Shasta Co. on *Fraxinus latifolia*[b]
Sulcaria badia	Bay horsehair lichen	–/–/FSS/–	304–609 (1,000–2,000)	On oaks and conifers in North Coastal forest

[a] Hale and Cole (1988)

[b] BLM and USFS (2006)

Table 5. Special-status bryophytes potentially occurring in the Study Area

Scientific Name	Common Name	Status Federal/ State/CNPS/ USFS/BLM	Elevation Range m (ft)[a]	Habitat Associations[a]
Mielichhoferia elongata	Elongate copper-moss	–/–/List 2.2/FSS/–	500–1,300 (1,640–4,265)	Cismontane woodland on metamorphic rock, usually vernally mesic areas
Trichodon cylindricus	Cylindrical trichodon	–/–/List 2.2/–/–	50–2,000 (164–6,562)	Broadleafed upland forest; meadows and seeps, sandy soils in upper montane coniferous forest; exposed soil; roadbanks
Ptilidium californicum	Pacific fuzzwort; leafy liverwort	–/–/–/FSS/BLMS	914– 1524 (3,000–5,000)[b]	Epiphytic on coniferous tree trunks, decaying logs, stumps and rarely on humus over rock[c]

[a] Unless otherwise noted, information from CNPS (2008)

[b] Christy and Wagner (1996)

[c] BLM and USFS (1997)

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Table 6. Special-status fungi potentially occurring in the Study Area

Scientific Name	Common Name	Status Federal/ State/ USFS/BLM	Habitat Associations[a]
Boletus pulcherrimus	Red-pored bolete	–/–/– /FSS/–	Mixed woods; coniferous forests
Cudonia monticola	Mountain cudonia	–/–/– /FSS/–	Coniferous forests
Dendrocollybia racemosa (*Collybia racemosa* in Mushrooms Demystified [Arora 1986])	Branched collybia	–/–/– /FSS/BLMS	Old decayed or blackened mushrooms (*Russula albonigra*); coniferous duff
Phaeocollybia olivacea	Olive phaeocollybia	–/–/– /FSS/BLMS	Woodlands; coniferous forests
Sowerbyella rhenana (*Aleuria rhenana* in Mushrooms Demystified [Arora 1986])	False orange peel	–/–/– /FSS/BLMS	Coniferous forests

[a] Arora (1986)

3.1.2 Special-interest Plants

Atarget species listof native plant species' populations suitable for revegetation source material, including a threshold abundance criterion to determine the population suitability (*i.e.*, the minimum aerial extent of a population can be anywhere from 1/4 to 1/2 acre to 5 acres, depending on access), was developed in consultation with the Shasta-Trinity National Forest (Table 7).

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Table 7. Native plant species' populations suitable for revegetation source material

Scientific name	Common name
Grasses	
Achnatherum spp.	Needlegrass
Bromus carinatus et al.	California brome (and other native bromes)
Deschampsia cespitosa	Tufted hairgrass
Deschampsia elongata	Slender hairgrass
Elymus elymoides	Blue wildrye
Festuca idahoensis	Idaho fescue
Festuca occidentalis	Western fescue
Festuca rubra	Western fescue
Hordeum brachyantherum spp. *californicum*	California barley
Poa secunda	Pine bluegrass
Vulpia microstachys	Small fescue
Vulpia octoflora	Annual fescue
Legumes	
Lupinus spp.	Lupines (native)
Lotus spp.	Lotus (native)
Lathyrus sulphureus	Sulphur pea
Thermopsis macrophylla	Golden pea
Trifolium spp.	Clovers (native)

A confidential list of culturally significant plants, including a threshold abundance criterion for each species, was developed in consultation with the Tribes during a series of meetings in early 2007 (personal communication, Tribes, and Nicole Jurjavcic, Botanist, Stillwater Sciences, Berkeley, CA, June 25, 2007). The list and survey results related to culturally significant plants will remain confidential; information will be presented directly to the Tribes as a confidential attachment to a report providing the results of Study Description CR-S2, *Assess Traditional Cultural Properties.*

3.2 Pre-field Review

A pre-field review was conducted in both Winter/Spring 2007 and Winter/Spring 2008 to:

1. Map known locations of targeted special-status plant, lichen or fungi species;
2. Review life history stages and habitat information for target species;
3. Determine the locations of potential suitable habitat for special-status species and special-interest plant, lichen and fungi species within the Study Area; and,

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4. Prepare and plan for field surveys.

Information on known occurrences of special-status vascular (Table 8) and non-vascular plants was compiled and plotted on a Geographic Information System (GIS) map. Five special-status vascular species had been previously documented in the Project Vicinity. No populations of special-status nonvascular species were previously documented. These known occurrences, combined with information about species' life histories and habitat requirements were used to determine: (1) the potential locations of suitable habitat for special-status species occurring within the Study Area, and (2) the appropriate timing of surveys.

Table 8. Previously documented occurrences of special-status vascular plant species in the Project Vicinity

Scientific Name	Common Name	Status Federal/State/ CNPS/ USFS/ BLM	Number of Populations Previously Documented	Location	Source
Calystegia atriplicifolia ssp. *buttensis*	Butte County morning glory	–/–/List 1B.2/FSS /BLMS	9	Several populations 1-2 km (0.5-1.2 mi) northeast of Pit 6 Powerhouse, two populations < 1km (0.5 mi) southeast of Pit 6 Powerhouse, and one population 1-2 km (0.5-1.2 mi) south/southeast of Pit 7 Afterbay	CNDDB
Clarkia borealis ssp. *borealis*	Northern clarkia	–/–/List 1B.3/FSS/BLMS	3	One population ~2 km (1.2 mi) southwest of Iron Canyon Reservoir, one population several km (2-3 mi) north of Iron Canyon Reservoir, and one population <1 km (0.5 mi) north of Pit 7 Afterbay	CNDDB
Fritillaria eastwoodiae	Butte County fritillary	–/–/List 3.2/FSS/–	1	Montgomery Creek Quad, approximately 0.4 miles North East of confluence of Little Cow Creek and Mill Creek, approximately 7.3 miles from Pit 7 Powerhouse	CNDDB

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Scientific Name	Common Name	Status Federal/State/ CNPS/ USFS/ BLM	Number of Populations Previously Documented	Location	Source
Smilax jamesii	English Peak greenbriar	–/–/List 1B.3/FSS/BLMS	8	One population at Iron Canyon Reservoir Deadlun Campground, two populations several km (2-3 mi) northwest of Iron Canyon Reservoir, one population a few km (2-3 mi) north of Iron Canyon Reservoir, and four populations a few km (2-3 mi) southeast of Iron Canyon Reservoir	personal communication, J. Nelson, District Botanist, USFS, Redding, CA, and N. Jurjavcic, Botanist, Stillwater Sciences, Berkeley, CA, June 29, 2007; CNDDB
Streptanthus longisiliquus	Long-fruit jewel-flower	–/–/List 4.3/FSS/–	7	One population in the Goose Gap quadrant, two populations <1 km (0.5 mi) east of Pit 6 Powerhouse along Pit 6 Road, one population 3 km (<2 mi) northeast of Iron Canyon Reservoir near Stump Creek, one population 2 km (1.2 mi) north of Pit 7 Powerhouse, one population in the Roaring Creek quadrant 4 km (2.5 mi) south of Pit 6 Powerhouse, and one population in the Miller Mountain quadrant	Taylor 1987

The timing of life history stages for each targeted special-status and special-interest species was identified so that surveys coincided with the phenological stage (*e.g.*, flowering or fruiting) during which the species was most easily identified in the field. To acquire a search image for each species and to familiarize the surveyors with the natural variations and key characteristics of each species, information was obtained through:

1. Consultation with the Shasta-Trinity National Forest botanist, Julie Nelson (personal communication, J. Nelson, District Botanist, USFS, Redding, CA, and N. Jurjavcic, Botanist, Stillwater Sciences, Berkeley, CA, April 22, 2007);
2. Visits to the University of California, Berkeley Jepson Herbarium; Humboldt State University Herbarium; and the Chico Herbarium in April 2007; and

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3. Reconnaissance visits to verify suitable habitat for particular species in April 2007 and 2008.

3.2.1 Field Surveys

Surveys for special-status and special-interest species were conducted by a two-person team, consisting of a lead and assistant botanist. Teams were led by individuals with: (1) experience conducting floristic field surveys; (2) knowledge of plant taxonomy and plant community ecology and classification; (3) familiarity with the plant, lichen, and fungi species of the area; (4) familiarity with appropriate state and federal statutes related to plants and plant, lichen, and fungi collecting; and (5) experience with analyzing effects of a project on native plant, lichen, and fungi species and communities. For non-vascular species, each two-person crew included at least one member who was trained to identify bryophytes and lichens.

The survey protocol followed the *Guidelines for Assessing Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Natural Communities* (CDFG 2000). Specifically, surveys were comprehensive for vascular and non-vascular plants and lichen species such that "every plant observed [will] be identified to the extent necessary to determine its rarity and listing status" (CDFG 2000). Surveys for fungi species, however, were incidental and species observed were identified only to the extent necessary to determine if it was a special-status species.

Field surveys were floristic in nature and identified vascular plants, lichen and bryophytes to species, subspecies, or variety, as necessary to verify the special-status taxon, using taxonomic keys for the region (*i.e.*, Hickman 1993, Nakamura and Nelson 2001, and Oswald 2002 for vascular species; McCune and Geiser 1997 for lichens; Norris and Shevock 2004 for bryophytes; and Arora 1986 for fungi). Two complete surveys of the Study Area were conducted to locate all potentially occurring special-status plant species during appropriate phenological periods, and to prepare an accurate inventory of the Study Area. For 2007 surveys, "Survey 1" occurred from April 24, 2007 to May 10, 2007, and "Survey 2" occurred from June 26, 2007 to July 12, 2007 (Table 9). For 2008 surveys, "Survey 1" occurred from May 7, 2008 to May 16, 2008, and "Survey 2" occurred from June 24, 2008 to July 3, 2008 (Table 9). For 2009 surveys at Claiborne Creek, "Survey 1" occurred on April 30, 2009, and "Survey 2" occurred on June 22, 2009 (Table 9). Finally, during 2009, follow-up surveys were conducted for the following species: potential *Fritillaria eastwoodiae* at Pit 7 Afterbay (April 2, 2009) and potential *Clarkia borealis* between Iron Canyon Spillway and Kosk Creek (June 8, 2009).

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Table 9. Botanical field survey schedule

General Areas

	Survey Site	Survey 1 Date	Survey 2 Date
Pit 6 and Associated Areas	Pit 6 Powerhouse	4/25/2007	6/27/2007
	Pit 6 Dam Face		
	Pit 6 Road	4/25/2007, 4/26/2007	6/27/2007– 6/29/2007
	Pit 6 Transmission Line		6/27/2007, 6/28/2007
Pit 7 , Pit 7 Afterbay, and Associated Areas	Pit 7 Powerhouse	4/24/2007	6/26/2007
	Pit 7 Dam Face		6/26/2007
	Pit 7 Road	4/24/2007, 4/26/2007	7/9/2007
	Pit 7 Transmission Line	5/1/2007	6/26/2007
	Pit 7 Afterbay Dam Face	4/24/2007	7/9/2007
	Pit 7 Afterbay road and associated areas	4/24/2007, 4/26/2007	
James B. Black and Associated Areas	James B. Black Powerhouse	5/2/2007	7/11/2007
	James B. Black Transmission Line		
	James B. Black Penstock	5/9/2007	
	12 KV Transmission Line		
Oak Mountain Road and Associated Areas	Oak Mountain Road	4/27/2007, 5/2/2007	7/2/2007, 7/3/2007
	Iron Canyon Surge Chamber		
	Willow Creek Siphon	4/27/2007	7/2/2007
Iron Canyon and Associated Areas	Iron Canyon Road and Hawkins Landing and Deadlun campgrounds	5/3/2007, 5/4/2007, 5/8/2007	7/5/2007, 7/6/2007
	Iron Canyon Reservoir perimeter		7/5/2007, 7/6/2007, 7/10/2007
	Gage MC-10	5/8/2007	
McCloud Reservoir and Associated Areas	McCloud Road and Reservoir perimeter	5/8/2007, 5/10/2007	7/12/2007
	Gage MC-1 at Ah-Di-Na Campground	5/8/2007	7/10/2007, 7/11/2007
	McCloud Tunnel		7/11/2007
Dispersed Recreation Sites	McCloud Reservoir	5/15/2008, 5/16/2008	7/2/2008, 7/3/2008
	McCloud Dam to Hawkins Tunnel	5/15/2008	7/2/2008
	Lower McCloud River	5/14/2008	7/1/2008

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General Areas	Survey Site	Survey 1 Date	Survey 2 Date
	National Forest System land at Claiborne Creek confluence	4/30/09	6/22/09
	Iron Canyon Reservoir	5/9/2008	6/25/2008
	James B. Black Powerhouse	5/9/2008	6/25/2008
	Pit 7 Afterbay	5/8/2008	6/24/2008
Additional Project-Affected Roads	Iron Canyon Spillway to Kosk Creek Road	5/8/2008	6/24/2008, 6/25/2008, 6/8/2009
Proposed Construction Areas	Proposed McCloud Transmission Line and Powerhouse	5/13/2008, 5/14/2008, 5/15/2008	6/30/2008, 7/1/2008, 7/2/2008
	Proposed Pit 7 Afterbay Powerhouse, Transmission Line, and access road to Pit 7 Afterbay Powerhouse	5/7/2008, 5/8/2008	6/24/2008, 4/2/2009

During both surveys, unique habitats of limited distribution capable of supporting special-status or special-interest plant, lichen, and fungi species (*e.g.,* limestone outcroppings, lava caps) were more comprehensively surveyed than habitats with a broader distribution (*e.g.,* mixed conifer forest).

All plant taxa encountered were identified to species, subspecies, or variety; if identification was not possible in the field, the plants were collected for identification. When collection would not endanger the local population (using the "1 in 20" rule, Wagner 1991), voucher collections were made of any plants confirmed or suspected to be special-status species. For non-vascular plant species identification, botanists collected vouchers specimens of all representative species at a Study Area site; collections were also made of any suspected rare species and submitted to local experts for verification.

Identified vascular special-status species were documented on CNDDB forms which will be submitted to CNDDB, with their location and population boundaries recorded in the field either using a geographical positioning system (GPS), or mapping onto a 2006 orthophoto field basemap. Information captured on the forms included the following:

Numbers of individuals,

Phenology,

Habitat description (*e.g.*, plant communities, dominant species, associated species, substrates/soils, aspects/slopes),

Relative condition of the population, and

Recognizable risk factors.

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In addition, photographs were taken to document diagnostic floral characteristics, growth forms, and habitat characteristics. Based on GPS and field-mapped locations, a GIS layer of point locations was created. Upon completion of the Project, the GIS data sets will be provided to the Shasta-Trinity National Forest office.

Identified special-status bryophyte, lichen and fungi species were documented on the USFS sighting forms which will be submitted to the Shasta-Trinity National Forest office. Information captured on the forms included the type of light (*e.g.*, sunny, partial shade, *etc.*), aspect, habitat, substrate, and elevation. The location and population boundaries were recorded in the field using a GPS, or mapped onto a 2006 orthophoto field basemap. Photographs were taken to document diagnostic characteristics, growth forms, and habitat characteristics. Based on GPS and field-mapped locations, a GIS layer of point locations was created.

Native plant species' populations suitable for revegetation source material and culturally significant plants were noted during the survey if the population size was above the developed threshold (*i.e.*, anywhere from 1/4 to 1/2 acre to 5 acres, depending on access). The location and population boundaries were recorded in the field using a GPS, or mapped onto a 2006 orthophoto field basemap. Based on GPS and field-mapped locations, a GIS layer of point locations was created. The synthesized data on culturally significant plants will be submitted directly to the Tribes as a confidential appendix to a report providing the results of Study Description CR-S2, *Assess Traditional Cultural Properties*. The following information was collected on data forms for all noted culturally significant and revegetation source plant populations:

Abundance category (where "sparse" is 1 – 10 plants, "patchy" is 11 – 50 plants; "widespread" is 50 – 100 plants; and "abundant" is 100+ plants);

Percent cover;

Dimensions of patch size;

Noteworthy associated species (*e.g.*, species that might be confused with targeted potential revegetation species);

Stage of plant (*i.e.,* vegetative/flowering/fruiting); and

Appropriate time for seed collection (*i.e.,* whether it was an early- or late-season seed producer).

Finally, the location and population boundaries of observed elderberry plants, with stems equal to or greater than 1-in. in diameter, were recorded in the field using a GPS, or mapped onto a 2006 orthophoto field basemap. Based on GPS and field-mapped locations, a GIS layer of elderberry plant locations was created.

4 RESULTS

A total of eight special-status vascular plants species within 49 populations, seven species within 22 populations suitable for revegetation source material, 32 species within 95 populations of culturally significant species, and 15 elderberry populations were identified during the botanical surveys. Comprehensive lists of all species observed in the Study Area are separated by site categories (*i.e.*, transmission line corridors, roads, tunnels, gages, Project facilities, and reservoir

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perimeters, dispersed recreation sites, and proposed infrastructure) and provided in Attachment 2. Note that the list for lichens and bryophytes is a sampling of species from each site, rather than an exhaustive list of all nonvascular species observed.

4.1 Special-status Vascular Plants

Populations of eight special-status vascular plant species were located within the Study Area: *Ageratina shastensis* (Shasta eupatorium); *Calystegia atriplicifolia* ssp. *buttensis* (Butte County morning glory); *Clarkia borealis* ssp. *borealis* (northern clarkia); *Fritillaria eastwoodiae* (Butte County fritillary), *Lewisia cotyledon* var. *howellii* (Howell's lewisia), *Smilax jamesii* (English Peak greenbriar); *Streptanthus longisiliquus* (long-fruit jewel-flower); and *Thermopsis gracilis* var. *gracilis* (slender false lupine). None of these species are federally or state listed; however, they all have a CNPS listing, are considered by the USFS to be sensitive species, and, in many cases, are considered to be a sensitive species by the BLM. Table 10 summarizes the special- status vascular plant occurrences; Figure 9 shows population locations. Upon completion of the Project, the GIS data sets will be provided to the Shasta-Trinity National Forest office, and to other agencies upon request.

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Table 10. Summary of special-status vascular plant occurrences in the Study Area, 2007, 2008, and 2009

Scientific Name	Common Name	Status Federal/State/ CNPS/USFS/ BLM	Sites	Occurrence Number (see Figure9)	Number of Populations per Site
Ageratina shastensis	Shasta eupatorium	–/–/List 4.2/FSE/–	Lower McCloud River Dispersed Recreation Sites	T_997	1
Calystegia atriplicifolia ssp. *buttensis*	Butte County morning glory	–/–/List 1B.2/FSS /BLMS	Pit 6 Road	T_981	1
			Pit 6 Transmission Line	T_986	1
			Pit 7 Transmission Line	T_988, T_989, T_990	3
Clarkia borealis ssp. *borealis*	Northern clarkia	–/–/List 1B.3/FSS/BLMS	Oak Mountain Road	T_962, T_963 T_964, T_965, T_967, T_968, T_969, T_970, T_971, T_972, T_973, T_974, T_975, T_977, T_978, T_979	16
			Pit 6 Road	T_982, T_983	2
			Pit 6 Transmission Line	T_985, T_987	2
Fritillaria eastwoodiae	Butte-county fritillary	–/–/List 3.2/FSS/–	Proposed Pit 7 Afterbay Powerhouse, Proposed Access Road to Pit 7 Afterbay Powerhouse, and Proposed Pit 7 Afterbay Transmission Line	T_991, T_992, T_993, T_1007, T_1008, T_1009	6
Lewisia cotyledon var. howellii	Howell's lewisia	–/–/List 3.2/– /–	Lower McCloud River Recreation Sites	T_994	1
			McCloud Dam to Hawkins Tunnel Recreation Sites	T_995	1

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Scientific Name	Common Name	Status Federal/State/ CNPS/USFS/ BLM	Sites	Occurrence Number (see Figure9)	Number of Populations per Site
Smilax jamesii	English Peak greenbriar	–/–/List 1B.3/FSS/BLMS	Iron Canyon Reservoir Road	T_957, T_958, T_959, T_960, T_961	5
Streptanthus longisiliquus (referred to as *S. shastensis* pre-publication [Clifton and Buck 2007])	Long-fruit jewel-flower	–/–/List 4.3/FSS/–	Oak Mountain Road	T_966, T_976	2
			Pit 6 Road	T_984	1
Thermopsis gracilis var. *gracilis (Thermopsis macrophylla* var. *venosa* in the Jepson Manual [Hickman 1993])	Slender false lupine	–/–/List 4.3/–/–	Pit 7 Afterbay Road	T_980 (note occurrence also within proposed Pit 7 Afterbay construction areas)	1 (note occurrence overlaps with one proposed Pit 7 Afterbay construction areas occurrence)
			Oak Mountain Road	T_1004, T_1005	2
			Proposed Pit 7 Afterbay Powerhouse, Proposed Access Road to Pit 7 Afterbay Powerhouse, and Proposed Pit 7 Afterbay Transmission Line	T_999, T_1000, T_1001	4 (note one occurrence overlaps with Pit 7 Afterbay Road)

Following are brief summaries of each species' life history and habitat associations, along with information on locations within the Study Area and any field observations of disturbance to the populations.

4.1.1 *Ageratina shastensis* (Shasta eupatorium)

Ageratina shastensis (Shasta eupatorium) is a perennial subshrub in the sunflower family (Asteraceae) that is classified as a CNPS List 4.2 (*i.e.*, limited distribution [watch list]; fairly endangered in California). It is limited to the Cascade Range, specifically Shasta County, from 400–1,800 m (1,300–5,900 ft). *Ageratina shastensis* typically occurs in chaparral and lower montane coniferous forest with rocky carbonate soils (CNPS 2008) or on limestone cliffs (Hickman 1993). *Ageratina shastensis* blooms from June to October.

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One population of *Ageratina shastensis* was found in the Study Area in 2008 (T_997). A voucher specimen of this population was collected, pressed, and later confirmed at the Jepson Herbarium by John L. Strother (personal communication, J. Strother, Curator of Compositae, University and Jepson Herbaria, Berkeley, CA, and Helen Beeson, Botanist, Stillwater Sciences, Berkeley, CA, December 10, 2008). The population was found at a dispersed recreation site in a partly shaded location adjacent to the Lower McCloud River, on a bank of exposed bedrock. Plant associates were predominantly herbaceous species, surrounded by *Alnus rhombifolia* (white alder) and *Salix* spp (willow species). Approximately five individuals were observed distributed across a small 0.1 m^2 (1 ft^2) patch. Site quality was excellent, with the only potential threats noted as trampling from white water recreation river access.

4.1.2 *Calystegia atriplicifolia* ssp. *buttensis* (Butte County morning glory)

Calystegia atriplicifolia ssp. *buttensis* (Butte County morning glory) is a perennial, rhizomatous herb in the morning glory family (Convolvulaceae) that is classified as a CNPS List 1B.2 species (*i.e.*, rare, threatened, or endangered in California and elsewhere; fairly endangered in California), USFS sensitive species (FSS), and BLM sensitive species (BLMS). It is endemic to California and occurs in chaparral, open areas in lower montane coniferous forests, and occasionally along roadsides. It is found in the High Cascade Range, Klamath Range, and San Francisco Bay Area (Mt. Diablo; Hickman 1993), as well as in Butte, Contra Costa, Del Norte, Mendocino, Shasta and Tehama counties (CNPS 2008). It prefers dry, rocky soils from 600– 1,524 m (1,900–5,000 ft) in elevation. *Calystegia atriplicifolia* ssp. *buttensis* blooms from May to July (CNPS 2008).

Five populations of *Calystegia atriplicifolia* ssp. *buttensis* were found in the Study Area, all during 2007 surveys. The first population (Population T_981; Figure 9 and Table 10) was found in a shady location along Pit 6 Road, in lower montane coniferous forest flats. Plant associates include *Calocedrus decurrens* (incense cedar), *Pinus lambertiana* (sugar pine), *Pinus ponderosa* (pacific ponderosa pine), *Pteridium aquilinum* (western brackenfern), *Quercus kelloggii* (California black oak), and *Symphoricarpos mollis* (creeping snowberry). Approximately 30–40 plants were observed distributed across lateritic clay soils with very shallow slopes, in an area of approximately 2,950 m^2 (31,820 ft^2). The second population (T_986) was also in the vicinity of Pit 6 in lower montane coniferous forest; this population was along the Pit 6 Transmission Line. The population was similar in size to the population along Pit 6 Road (3,165 m^2 [34,080 ft^2]), with about 50 individuals occurring across laterite clay soils with low slope and a slight west Plant associates included *Achnatherum* spp. (needlegrasses), *Arctostaphylos patula* (greenleaf mazanita), *Calocedrus decurrens*, *Pinus ponderosa*, *Pteridium aquilinum*, *Quercus* aspect. The remaining three populations (T_988, T_989, and T_990) were all observed along the Pit 7 Transmission Line. Population T_988, a *kelloggii*, *Solidago californica* (California goldenrod), and *Symphoricarpos mollis*. population of approximately 40 individuals and 430 m^2 (4,620 ft^2), was distributed across red clay soils sparsely mixed with small rocks and had an east aspect. Plant associates included *Centaurea solstitialis* (yellow star-thistle) and *Rubus discolor* (Himalayan blackberry). Population T_989 was similar in size (approximately 35 individuals; 58 m^2 [630 ft^2]) and substrate; plant associates also included *Centaurea solstitialis* in addition to *Achnatherum* sp., *Hypericum perforatum* (common St. Johnswort), and *Plantago lanceolata* (narrowleaf plantain). The last population, Population T_990, contained over 300 individuals across 11,920 m^2 (128,300 ft^2). It was located on red clay soils at a southeast aspect and 20

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percent slope; plant associates include *Achnatherum* sp., *Ceanothus prostratus* (prostrate ceanothus), *Quercus kelloggii*, and *Solidago* sp.

These five populations likely overlap with some of the previously documented occurrences. According to CNDDB, nine populations were documented within the Project Vicinity (Table 8, CDFG 2006); records indicate six populations 1–2 km (0.5–1.2 mi) northeast of Pit 6 Powerhouse, two populations less than 1 km (0.5 mi) southeast of Pit 6 Powerhouse, and one population 1–2 km (0.5–1.2 mi) south/southeast of Pit 7 Afterbay.

4.1.3 *Clarkia borealis* ssp. *borealis* (northern clarkia)

Clarkia borealis ssp. *borealis* (northern clarkia) is an annual herb in the primrose family (Onagraceae) that is classified as a CNPS List 1B.3 (*i.e.*, rare, threatened, or endangered in California and elsewhere; not very endangered in California), USFS Sensitive Species (FSS), and BLM sensitive species (BLMS). It is endemic to California and locations are known only in Shasta and Trinity counties (CNPS 2008). It occurs in chaparral, cismontane and foothill woodlands, and lower montane coniferous forest habitats between elevations of 400 and 1,340 m (1,300–4,400 ft). The blooming period is June to September (CNPS 2008).

During 2007 surveys, 20 *Clarkia borealis* ssp. *borealis* populations were located throughout the Study Area (Figure 9 and Table 10); 16 populations along Oak Mountain Road (T_962, T_963 T_964, T_965, T_967, T_968, T_969, T_970, T_971, T_972, T_973, T_974, T_975, T_977, T_978, and T_979), two populations along Pit 6 Road (*i.e.*, T_982 and T_983), and two populations along Pit 6 transmission line (T_985 and T_987).
All of the 20 populations documented are likely newly documented occurrences.
Although three populations were previously documented in the Project Vicinity (Table 8, CDFG 2006), they do not appear to overlap populations documented in 2007 and 2008 surveys.

During 2008 surveys, two additional potential *Clarkia borealis* ssp. *borealis* populations were located along the road between Iron Canyon Spillway to Kosk Creek Road.
These two populations recorded during 2008 surveys required further follow-up surveys in 2009 to confirm species identification, as the species requires identification using a combination of buds, petal length, and stigma length; 2008 surveys occurred as the individuals were beginning to set fruit. In 2009, it was determined that the populations were not *C. borealis* but rather *C. rhomboideae* (identification was confirmed by personal communication, L. Janeway, Botanist, Chico Herbarium, Chico, CA, and N. Jurjavcic, Botanist, Stillwater Sciences, Berkeley, CA, June 19, 2009).

Oak Mountain Road populations varied in size from 3–280 individuals, with an average population size of approximately 78 individuals. Patch size ranged from 20–910 m^2 (200–9,760 ft^2), with an average geographic extent of 250 m^2 (2,640 ft^2). Soils varied from loose soil at rocky roadcuts or hillsides to fine clay-like soils with pine needle duff; aspect ranged from southern to eastern/northeastern; and, slopes ranged from flat up to 90 percent. Four Oak Mountain Road populations (T_972, T_973, T_974, and T_975) occurred in openings of the forest canopy, on the edge of privately-owned areas that had been managed and thinned. Plants were generally found in open rocky hillsides associated with *Bromus diandrus* (ripgut brome), *Bromus tectorum* (cheatgrass), *Ceanothus integerrimus* (deerbrush), *Madia* sp. (tarweed), and

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Melica harfordii (Harford's oniongrass), transitioning into the understory of lower montane mixed conifer forest with *Cercis occidentalis* (California redbud), *Cornus nuttalii* (pacific dogwood), *Cynosurus echinatus* (bristly dogstail grass), *Pinus ponderosa*, *Pseudotsuga menziesii* (Douglas-fir), *Pteridium aquilinum*, *Quercus chrysolepis* (canyon live oak), and *Quercus kelloggii*. Other associated plants include *Acer* spp. (maple species), *Arctostaphylos* sp. (manzanita), *Calystegia occidentale* (chaparral false bindweed), *Carex multicaulis* (manystem sedge), *Dicentra formosa* (pacific bleeding heart), *Hieracium albiflorum* (white hawkweed), *Hypericum perforatum*, *Iris tenuissima* (longtube iris), *Keckiella lemmonii* (Lemmon's keckiella), native bunchgrasses, *Potentilla glandulosa* (sticky cinquefoil), *Ribes roezlii* (Sierra gooseberry), *Sambucus mexicana* (blue elderberry), *Torilis arvensis* (spreading hedgeparsley), *Toxicodendron diversilobum* (pacific poison oak), and *Viola* sp. (violet). The two Pit 6 Road populations, T_982 and T_983, were large with approximately 400 and 75 individuals across 1,160 m^2 (12,430 ft^2) and 300 m^2 (3,230 ft^2), respectively. Populations occurred in mixed coniferous forest on cliff banks and road cuts with a mix of cobble and clay soils. Plant associates included *Ceanothus integerrimus*, *Cynosurus echinatus*, *Quercus chrysolepis*, *Quercus kelloggii*, and *Toxicodendron diversilobum*. Finally, the two Pit 6 transmission line populations (T_985 and T_987) contained 200 and 15 individuals across 1,650 m^2 (17,750 ft^2) and 3,390 m^2 (36,500 ft^2), respectively, and occurred on volcanic to laterite clay soils. Plant associates at these populations included *Achnatherum* sp., *Cirsium vulgare*, *Dicentra formosa, Lactuca serriola*, *Pteridium aquilinum*, *Rubus parviflorus*, and *Torilis arvens*

4.1.4 *Fritillaria eastwoodiae* (Butte County fritillary)

Fritillaria eastwoodiae (Butte County fritillary) is a perennial herb in the lily family (Liliaceae). It is classified under CNPS List 3.2 (*i.e.*, more information needed about this plant [review list]; fairly endangered in California) and its distribution is limited to the Cascade Range, specifically Tehama, Butte, and Shasta Counties (Hickman 1993). It is found at elevations from 50–1,500 m (160–4,900 ft) on dry benches and slopes, generally in chaparral, cismontane woodland and openings in lower montane coniferous forest (CNPS 2008, Hickman 1993). It typically blooms between March and June.

During 2008 surveys, three potential populations of *Fritillaria eastwoodiae* were located throughout the Study Area; all populations were found within the proposed Pit 7 Afterbay Powerhouse and proposed access road to Pit 7 Afterbay Powerhouse (T_991, T_992, and T_993). These three populations recorded required further follow-up surveys in 2009 to confirm species identification, as the species requires identification using a combination of style branching, perianth color and curvature, and perianth position (*i.e.* nodding versus erect); 2008 surveys occurred as the individuals were beginning to set fruit. During 2009 surveys, these three populations were confirmed to be *F. eastwoodiae* and three additional populations (T_1007, 1_1008, T_1009) were located (Figure 9 and Table 10). All six populations are likely newly documented occurrences. Although one population was previously documented in the Project Vicinity (Table 8, CDFG 2006), it does not overlap these newly documented populations.

The six populations ranged in population size from 5 individuals (T_992) to over 50 individuals (T_993). The geographic extent of each population ranged from 0.4 m^2 (4.0 ft^2; T_1007, T_1008, and T_1009) to 11.0 m^2 (118.6 ft^2; T_993), with a total geographic extent of all six populations of 20.5 m^2 (220.7 ft^2). They occurred on the slopes of an *Acer macrophyllum* and

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Pseudotsuga menziesii dominated coniferous forest; plant associates at these populations included *Adiantum jordanii* (California maidenhair), *Asarum hartwegii* (wild ginger), *Cornus nuttalii*, *Ceanothus integerrimus*, *Dodecatheon hendersonii* (mosquito bills), *Fraxinus dipetala* (California ash), *Hypericum perforatum*, *Lonicera interrupta* (chaparral honeysuckle), *Luzula comosa* (hairy wood rush), *Polystichum imbricans* (narrowleaf swordfern), *Quercus berberidifolia* (scrub oak), *Quercus chrysolepis*, *Rubus ursinus* (California blackberry), *Sanicula crassicaulis* (Pacific blacksnakeroot), *Styrax officinalis* (snowdrop bush), *Symphoricarpos albus* (snowberry), *Toxicodendron diversilobum*, and *Trientalis latifolia* (starflower).

4.1.5 *Lewisia cotyledon var. howellii* (Howell's lewisia)

Lewisia cotyledon var. *howellii* (Howell's lewisia) is a perennial herb in the purslane family (Portulacaceae) that is classified as a CNPS List 3.2 (*i.e.*, more information needed about this plant [review list]; fairly endangered in California). Its distribution ranges from Idaho through Oregon to Northern California where it is limited to the Klamath and High Cascade Ranges, specifically Shasta, Del Norte, Trinity, Humboldt and Siskiyou counties (CNPS 2008, Hickman 1993). In California, it occurs at elevations ranging from 150–2,010 m (490–6,600 ft) on rock outcrops and canyon walls in broadleafed upland forest, chaparral, cismontane woodland, and lower montane coniferous forest (CNPS 2008, Hickman 1993). Its blooming period is from April to July (CNPS 2008).

During 2008 surveys, two populations of *Lewisia cotyledon* var. *howellii* were located throughout the Study Area (Figure 9 and Table 10); one population was found within a Lower McCloud River recreation site (T_994) and the second within a McCloud Dam to Hawkins Tunnel recreation site (T_995). Both populations are newly documented occurrences, as no populations were previously documented in the Project Vicinity.

Both populations occurred on rocky outcrops directly adjacent to the McCloud River. Population T_994 was well established, containing approximately 60–70 individuals across 152.1 m^2 (1,637 ft^2). This rocky outcrop was partly shaded by *Quercus chrysolepis*; plant associates included *Poa bulbosa*, *Sedum spathulifolium*, *Toxicodendron diversilobum*, and *Viola sheltonii*. Population T_995 occurred across two patches on both sides of the river, with the smaller of the two patches within the Study Area (*i.e.*, river left). The river left portion of the population was limited to approximately 25 individuals across 12.2 m^2 (130.1 ft^2); the river right portion of the population, just outside of the Study Area, was very large: approximately 500 individuals across 302.1 m^2 (3,251.8 ft^2). The population was partly shaded by *Quercus chrysolepis* and *Alnus rhombifolia*; understory plant associates included *Heuchera micrantha*, *Nemophila heterophylla*, *Potentilla glandulosa*, and a variety of bryophytes.

4.1.6 *Smilaxjamesii* (English peak greenbriar)

Smilax jamesii (English peak greenbriar) is a perennial, rhizomatous, herbaceous vine in the lily family (Liliaceae) that is classified as a CNPS List 1B.3 (*i.e.*, rare, threatened, or endangered in CA and elsewhere; not very endangered in California), USFS Sensitive Species (FSS), and BLM sensitive species (BLMS). It is endemic to California and is found in the Cascade and Klamath ranges (Hickman 1993), as well as Del Norte, Shasta, Siskiyou, and Trinity counties, typically at elevations of 580–2,500 m (1,900–8,000 ft; CNPS 2008). It occurs in alder thickets within

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montane coniferous forest, broadleaved upland forest, lakesides, streambanks, lower montane coniferous forest, marshes and swamps, north coast coniferous forest, and streambanks and lake margins within upper montane coniferous forest (CNPS 2008, Hickman 1993). It blooms from May to July, although extending occasionally into August (CNPS 2008).

During the 2007 surveys, five populations of *Smilax jamesii* were documented within the Study Area (T_957, T_958, T_959, T_960, and T_961). All were located along Iron Canyon Reservoir Road (Figure 9 and Table 10). Population sizes were generally small, with anywhere from four to 40 individuals per population and patch sizes ranging between 120–800 m^2 (1,320–8,610 ft^2), with an average patch size of 380 m^2 (4,090 ft^2). All populations occurred in shady areas, often near creeks. Plant associates include *Abies concolor* (white fir), *Calocedrus decurrens*, *Campanula* sp. (bellflower), *Corylus cornuta* var. *californica* (beaked hazelnut), *Pseudotsuga menziesii*, *Pteridium aquilinum*, and *Quercus kelloggii*. At least one of these populations was previously documented near the Deadlun Campgrounds (Table 8; personal communication, J. Nelson, District Botanist, USFS, Redding, CA, and Nicole Jurjavcic, Botanist, Stillwater Sciences, Berkeley, CA, June 29, 2007).

4.1.7 *Streptanthus longisiliquus* (long-fruit jewel-flower)

Streptanthus longisiliquus (long-fruit jewel flower) is a short-lived, perennial, taprooted herb in the mustard family (Brassicaceae) that is classified as a CNPS List 4.3 (*i.e.*, limited distribution [watch list]; not very endangered in California) and USFS Sensitive Species (FSS). It is endemic to California and more specifically Butte, Shasta, and Tehama counties. Recently described by Clifton and Buck (2007), its range is limited to the eastern side of the Klamath Range at the southern edge of the Cascade Range and the western side of the northernmost Sierra Nevada Mountains. It occurs at elevations from 715–1,500 m (2,350– 5,000 ft) throughout cismontane woodlands and lower coniferous forest openings (Clifton and Buck 2007, CNPS 2008, Taylor 1987). *Streptanthus longisiliquus* blooms from April to September and occurs across a variety of soil types, often in areas of disturbance (Clifton and Buck 2007).

Three populations of this newly described *Streptanthus* species were documented during 2007 surveys (Figure 9 and Table 10); two populations along Oak Mountain Road (T_966 and T_976; ten and four individuals, respectively) and one population along Pit 6 Road (T_984; 10 individuals). One Oak Mountain Road population, T_966, was growing on open, rocky slopes of the roadcut (80 percent slope, eastern aspect); the substrate was a mix of small, loose, pebble sized rocks with larger boulders crumbling down the hillside; and, the geographic extent of the population was 460 m^2 (4,930 ft^2). Plant associates included *Bromus diandrus*, *Bromus tectorum*, and *Ceanothus integerrimus*. The other Oak Mountain Road population, T_976, occurred on clay soils within mixed conifer hardwood forest; plant associates across the 70 m^2 (720 ft^2) included an overstory of *Pseudotsuga menziesii* and *Quercus kelloggii* and understory dominants *Apocynum androsaemifolium* (spreading dogbane) and *Ceanothus integerrimus*. The Pit 6 Road population T 984 occurred across 630 m^2 (6,790 ft^2) in a sunny, open roadcut just below the ridge. Soils were a mix of volcanic breccia and clay; the aspect was southeastern and slopes nearly 100 percent. Plant associates include *Achnatherum* sp., *Arctostaphylos patula*, *Arctostaphylos viscida* (sticky whiteleaf manzanita), *Calocedrus decurrens*, *Ceanothus integerrimus*, and *Pinus ponderosa*.

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Seven populations of *Streptanthus longisiliquus* were previously documented in the Project Vicinity (Table 8). One population documented during the 2007 surveys along Pit 6 Road may overlap with populations documented in 1987 less than 1 km (0.5 mi) east of Pit 6 Powerhouse along Pit 6 Road (Taylor 1987). However, the Oak Mountain road occurrences are newly documented.

4.1.8 *Thermopsis gracilis* var. *gracilis* (slender false lupine)

Thermopsis gracilis var. *gracilis* (slender false lupine) is a rhizomatous herb in the pea family (Fabaceae) and is classified as a CNPS List 4.3 (*i.e.*, limited distribution [watch list]; not very endangered in California). It occurs in the Klamath and North Coast ranges in California north through Oregon (Hickman 1993), specifically in Del Norte, Humboldt, Shasta, Siskiyou and Trinity counties (CNPS 2008). Elevations range from 100–1,370 m (300–4,500 ft) in open, often dry sites (sometimes roadsides), including chaparral, cismontane woodland, lower montane coniferous forest, meadows and seeps, and north coast coniferous forest (CNPS 2008, Hickman 1993). Its blooming period is from March to July (CNPS 2008).

The 2007 and 2008 surveys revealed six populations of *Thermopsis gracilis* var. *gracilis* across the Study Area (Figure 9 and Table 10), one along Pit 7 Afterbay Road (T_980), two along Oak Mountain Road (T_1004 and T_1005), and a total of four (three new, and a re-occurrence of T_980 due to overlap in survey area) along proposed Pit 7 Afterbay Transmission Line. All populations found are newly documented occurrences, as no populations were previously documented in the Project Vicinity.

Population T_980 contained approximately 50 individuals distributed across 150 m^2 (1,650 ft^2). This population was on the roadside at Fenders Flat, above the Pit River in lower montane forest. Soils were a mix of cobble and clay; the site had a very low slope and northwest aspect. Dominant plant associates were *Pseudotsuga menziesii* and *Quercus chrysolepis*. The two populations along Oak Mountain Road, T_1004 and T_1005, contained over 220 individuals across 8.4 m^2 (90.5 ft^2) and 244.2 m^2 (2,628.5 ft^2), respectively. These two populations were located in openings of mixed coniferous forest, directly adjacent to the road. Plant associates included *Apocynum androsaemifolium*, *Ceanothus integerrimus*, *Cornus nuttallii*, *Pinus ponderosa*, *Pseudotsuga menziesii*, *Pteridium aquilinum*, *Quercus kelloggii*, and *Toxicodendron diversilobum*.

The three newly mapped populations along the proposed Pit 7 Afterbay Transmission Line (T_999, T_1000, and T_1001) contained 300–350 individuals across a total of 41.7 m^2 (449.1 ft^2). Plant associates included an overstory dominated by *Ceanothus intergerrimus*, *Pinus ponderosa*, and *Pseudotsuga menziesii*, and an understory of *Calocedrus decurrens* seedlings, *Calycanthus occidentalis*, *Galium aparine*, *Hypericum perforatum*, *Toxicodendron diversilobum*, and *Vulpia myuros*.

4.2 Special Interest Plants

4.2.1 Native Plant Species' Populations Suitable for Revegetation Source Material

During the2007and 2008 botanical surveys, 22populations of potentialrevegetationsource material were located within the Study Area (*i.e.*, 16 within existing Project facilities and dispersed recreation sites; six along proposed infrastructure). Table 11 summarizes details of

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each of these populations, including site location, patch dimensions, and abundance code. Figure 10 shows population locations.

Table 11. Summary of native plant species' populations suitable for revegetation source material

Scientific Name	Common Name	Sites	Number of Populations per Site 1	Abundance Code[a]	Occurrence Number (see Figure 10)	Dimensions of Populations (ft)
Achnatherum lemmonii	Lemmon's needlegrass	James B. Black Penstock		A	R_877	150 x 20
		McCloud Dam to Hawkins Tunnel Recreation Sites	2	A	R_17, R_24	100 x 10, 50 x 75
		Lower McCloud River Recreation Sites	1	A	R_23	100 x 100
		McCloud Reservoir Recreation Sites	1	A	R_26	70 x 30
		Proposed McCloud Transmission Line and Proposed McCloud Powerhouse	4	A	R_19, R_20, R_21, R_22	100 x 5 100 x 50 200 x 15 100 x 15
Achnatherum occidentale	Western needlegrass	Oak Mountain Road	1	A	R_881	100 x 50
		Iron Canyon Reservoir Perimeter	1	W	R_872	20 x 20
		Pit 7 Transmission Line	1	A	R_883	150 x 40
		~~Pit 6 Road~~ ~~McCloud Tunnel~~ at Hawkins Creek	1	A	R_882	75 x 200
		~~Iron Canyon~~ Reservoir Road and Hawkins Landing and Deadlun	1	A	R_878	200 x 200
			1	A	R_875	60 x 60

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Scientific Name	Common Name	Sites	Number of Populations per Site	Abundance Code[a]	Occurrence Number (see Figure 10)	Dimensions of Populations (ft)
		campgrounds			R_27	Not mapped, all along
		Proposed McCloud Transmission Line and Proposed McCloud Powerhouse	1	A		segments 27-30
Bromus carinatus var. *carinatus*	California brome	Iron Canyon Reservoir Perimeter	1	W	R_873	20 x 20
Elymus elymoides	Squirreltail	Iron Canyon Reservoir Perimeter	1	A	R_874	30 x 30
Elymus glaucus	Blue wildrye	Oak Mountain Road	1	W	R_879	25 x 25
		Proposed Pit 7 Afterbay Powerhouse, Proposed Access Road to Pit 7 Afterbay Powerhouse, and Proposed Pit 7 Afterbay Transmission Line	1	A	R_16	100 x 30
Lupinus bicolor	Miniature lupine	James B. Black Penstock	1	A	R_876	40 x 20
Melica harfordii	Harford's oniongrass	Oak Mountain Road	1	A	R_880	200 x 50

[a] **Abundance Categories**: **S**parse (1 – 10 plants); **P**atchy (11 – 50 plants); **W**idespread (50 – 100 plants); **A**bundant (100+plants)

Following are brief summaries of each species' life history and habitat associations, along with information on population locations within the Study Area.

4.2.1.1 *Achnatherum* spp. (needlegrass)

Achnatherum (needlegrass) species are perennial members of the grass family (Poaceae). Seventeen species of *Achnatherum* occur throughout California, only one of which is not a native species. Five species have distributions that overlap the Project Vicinity (*A. hymenoides* [Indian ricegrass], *A. lemmonii* ssp. *lemmonii* [Lemmon's needlegrass], *A. nelsonii* ssp. *dorei* [Dore's

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needlegrass], and *A. occidentale* [western needlegrass, both *A. o.* ssp. *californicum* and *A. o.* ssp. *pubescencs*], Hickman 1993; plus *A. stillmanii* [Stillman's needlegrass], Oswald 2002). Surveys in 2007 identified three species and one subspecies as occurring within the Study Area: *A. lemmonii*, *A. occidentale*, *A. o.* ssp. *pubescens* [pubescent western needlegrass], and *A. stillmanii*. These species generally occur below 1,550–2,300 m (5,000–7,500 ft, although *A. o.* ssp. *pubescens* can occur up to 3,100 m [10,200 ft] in elevation), in coniferous forest (including red fir forest and yellow pine forest), foothill woodland, rocky slopes, and sagebrush scrub (Hickman 1993, Oswald 2002). *A. stillmanii* is relatively uncommon and is endemic to California. *Achnatherum* species generally bloom in late spring and early summer.

A total of sixteen populations of *Achnatherum* species were of sufficient size to be suitable for revegetation source material, seven from 2007 and nine from 2008. In 2007, one population of *A. lemmonii* (R_877) and six populations of *A. occidentale* (R_881, R_872, R_883, R_882, R_878, and R_875) were mapped (Table 11 and Figure 10). Populations were distributed widely across the Study Area, including populations at Iron Canyon Reservoir Perimeter, Iron Canyon Reservoir Road (Hawkins Landing and Deadlun campgrounds), James B. Black Penstock, McCloud Tunnel at Hawkins Creek, Oak Mountain Road, Pit 6 Road, and Pit 7 Transmission Line. In 2008, eight populations of *Achnatherum lemmonii* (R_17, R_24, R_19, R_20, R_21, R_22, R_23, and R_26) and one population of *Achnatherum occidentale* (R_27) were mapped. The majority of populations were found at the proposed McCloud Transmission Line and Powerhouse and McCloud Dam to Hawkins Tunnel Recreation Sites; however, two populations were also found at Lower McCloud River Recreation Sites and McCloud Reservoir Recreation Sites.

4.2.1.2 *Bromus carinatus* var. *carinatus* (California brome)

Bromus carinatus var. *carinatus* (California brome) is a perennial member of the grass family (Poaceae). It is distributed throughout California, except the Central Valley and Sonoran Desert, in a wide variety of plant communities; associated habitats include chaparral, coniferous forest, foothill woodland, open scrub, red fir forest, riparian woodland, subalpine forest, and yellow pine forest (Hickman 1993, Oswald 2002).
Elevations range up to 3,500 m (11,500 ft).
Individuals flower during April through August (Munz and Keck 1973), sometimes within the first year of growth (Hickman 1993).

Only one population of *Bromus carinatus* was located in the Study Area that was suitable for revegetation source material. The population (R-873) was located during 2007 surveys along Iron Canyon Reservoir Perimeter and contained between 50 and 100 individuals (Table 11 and Figure 10).

4.2.1.3 Elymus elymoides (squirreltail)

Elymus elymoides (squirreltail) is a perennial member of the grass family (Poaceae). It occurs at elevations of 600–4,200 m (1,960–13,780 ft) in the Cascade, Klamath, Peninsular, Sierra Nevada, and Transverse ranges, as well as throughout the desert, Great Basin Floristic Province, and San Francisco Bay Area. It prefers dry, open habitat including chaparral, red fir forest, sagebrush scrub, subalpine forest, and yellow pine forest communities (Hickman 1993 and Oswald 2002). *Elymus elymoides* blooms July through August (Munz and Keck 1973).

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One population of *Elymus elymoides* was documented in the Study Area during 2007 surveys, specifically in the Iron Canyon Reservoir Perimeter (Table 11 and Figure 10). Population R_874 contained over 100 plants across a 275 m^2 (900 ft^2) area.

4.2.1.4 *Elymus glaucus* (blue wildrye)

Elymus glaucus (blue wildrye) is a rhizomatic and occasionally stoloniferous perennial member of the grass family (Poaceae). It occurs throughout California at elevations less than 2,500 m (8,200 ft) (Hickman 1993). It is associated with a wide variety of plant communities, including chaparral, forest, open areas, red fir forest, woodland, and yellow pine forest (Hickman 1993, Oswald 2002). It begins blooming as early as June and continues through August (Munz and Keck 1973).

Two patches of *Elymus glaucus* were large enough to be suitable for revegetation source material, one in 2007 and one in 2008. In 2007, one population, R_879, was located along Oak Mountain Road and contained approximately 50–100 individuals (Table 11 and Figure 10). In 2008, one population, R_16, was found at the proposed Pit 7 Afterbay Transmission Line, and contained over 100 plants.

4.2.1.5 *Lupinus bicolor* (miniature lupine)

Lupinus bicolor (miniature lupine) is an annual or occasional biennial (in northern California) in the legume family (Fabaceae). It is a ubiquitous species that occurs throughout open and disturbed areas in California below 1,600 m (5,250 ft). Associated plant communities include foothill and riparian woodlands, valley and foothill grasslands, and yellow pine forest (Oswald 2002). It blooms from March through June (Munz and Keck 1973).

One population of *Lupinus bicolor* was documented during 2007 surveys that would be a potential source for revegetation material. This population (R_876) was located at James B. Black Penstock (Table 11 and Figure 10). Surveyors recorded over 100 plants across a 240 m^2 (800 ft^2) area.

4.2.1.6 *Melica harfordii* (Harford's oniongrass)

Melica harfordii (Harford's oniongrass) is a perennial member of the grass family (Poaceae). It occurs throughout dry slopes in coniferous forest below 2,150 m (7,050 ft), including in chaparral, red fir forest, and yellow pine forest communities (Hickman 1993 and Oswald 2002). It blooms from May through July (Munz and Keck 1973).

In the McCloud-Pit botanical survey Study Area, 2007 surveys documented one population of *Melica harfordii* suitable for revegetation source material. This population, R-880, was located along Oak Mountain Road (Table 11 and Figure 10). There were over 100 individuals at this site, dispersed across a 1,000 m^2 (3,280 ft^2) area.

4.2.2 Culturally Significant Plant Species

Aconfidentialattachmenttoa report providingthe results of Study Description CR-S2, *Assess Traditional Cultural Properties*, will provide information on the location of culturally significant

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plant species occurring within the Study Area by site category (*i.e.*, transmission line corridors, roads, tunnels, gages, Project facilities, reservoir perimeters, dispersed recrecation sites, and proposed infrastructure). This attachment will also contain maps and attribute data for populations that were above the designated threshold abundance. This data will be provided directly to the Tribes and other parties in accordance with the Memorandum(a) of Understanding between PG&E and the Tribes for completing Study Description CR-S2.

4.2.3 Elderberry

During 2007 and 2008 botanical surveys, 15 elderberry populations were located within the Study Area. Table 12 summarizes details of each of these populations, including which sites populations were located at, the patch dimensions, and abundance code. Figure 11 shows population locations.

Table 12. Summary of elderberry (*Sambucus mexicana*) populations

Sites	Number of Populations per Site	Abundance Code[a]	Occurrence Number (see Figure11)	Percent Cover	Dimensions of Populations (ft)
Iron Canyon Reservoir Perimeter	2	S	WP_896	20	10 x 10
		S	WP_891	45	5 x 20
Iron Canyon Reservoir Road and Hawkins Landing and Deadlun campground areas	4	S	WP_903	40	15 x 10
		S	WP_907	60	5 x 5
		S	WP_905	80	5 x 4
		S	WP_906	90	10 x 10
Iron Canyon Tunnel at Willow Creek Siphon	1	P	WP_910	80	15 x 15
McCloud Reservoir Perimeter and Road	3	A	WP_913	80	12 x 7
		S	WP_915	60	6 x 8
		S	WP_916	75	3 x 2
McCloud Tunnel at Hawkins Creek Crossing	1	S	WP_921	30	20 x 10
McCloud Dam to Hawkins Tunnel Recreation Sites	1	S	WP_1002	75	5 x 10
Oak Mountain Road	2	P	WP_936	60	40 x 10
		S	WP_934	20	5 x 5
Pit 7 Afterbay Road and HawkinsLanding and Deadluncampground areas	1	S	WP_950	40	10 x 10

[a] **Abundance Categories**: **S**parse (1 – 10 plants); **P**atchy (11 – 50 plants); **W**idespread (50 – 100 plants); **A**bundant (100+plants).

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Sambucus mexicana is a perennial in the honeysuckle family (Caprifoliaceae). It is a large, deciduous shrub or small tree generally lacking a main trunk (Hickman 1993). It typically occurs within chaparral, foothill woodland, red fir forest, riparian forests and woodlands, and yellow pine forest throughout California, along streambanks and forest openings below 3,000 m (9,840 ft) (Hickman 1993, Oswald 2002). According to Holland (1986), *Sambucus mexicana* is the characteristic species of the Elderberry Savanna plant community, which borders riparian forests in some areas. It typically grows in association with various species of woody plants, often on the top and slope of banks, and rarely on sandbars (Kellner 1992).

During 2007 and 2008 botanical surveys, fifteen populations of *Sambucus mexicana* were documented occurring across the Study Area (WP_896, WP_891, WP_903, WP_907, WP_905, WP_906, WP_910, WP_913, WP_915, WP_916, WP_921, WP_1002, WP_936, WP_934, and WP_950) (Table 12 and Figure 11). Most of the populations were sparse, with between one and ten individuals. However, two populations (WP_910 and WP_936) contained between eleven and 50 individuals and one population (WP_913) had over 100. Aside from the measurements reported in Table 12 (*i.e.*, abundance, percent cover, and patch size), no additional information (*i.e.*, number of stems greater than or equal to one inch in diameter at ground level and the presence or absence of valley elderberry longhorn beetle exit holes) was recorded on the *Sambucus mexicana* populations; this information was not a defined part of this study.

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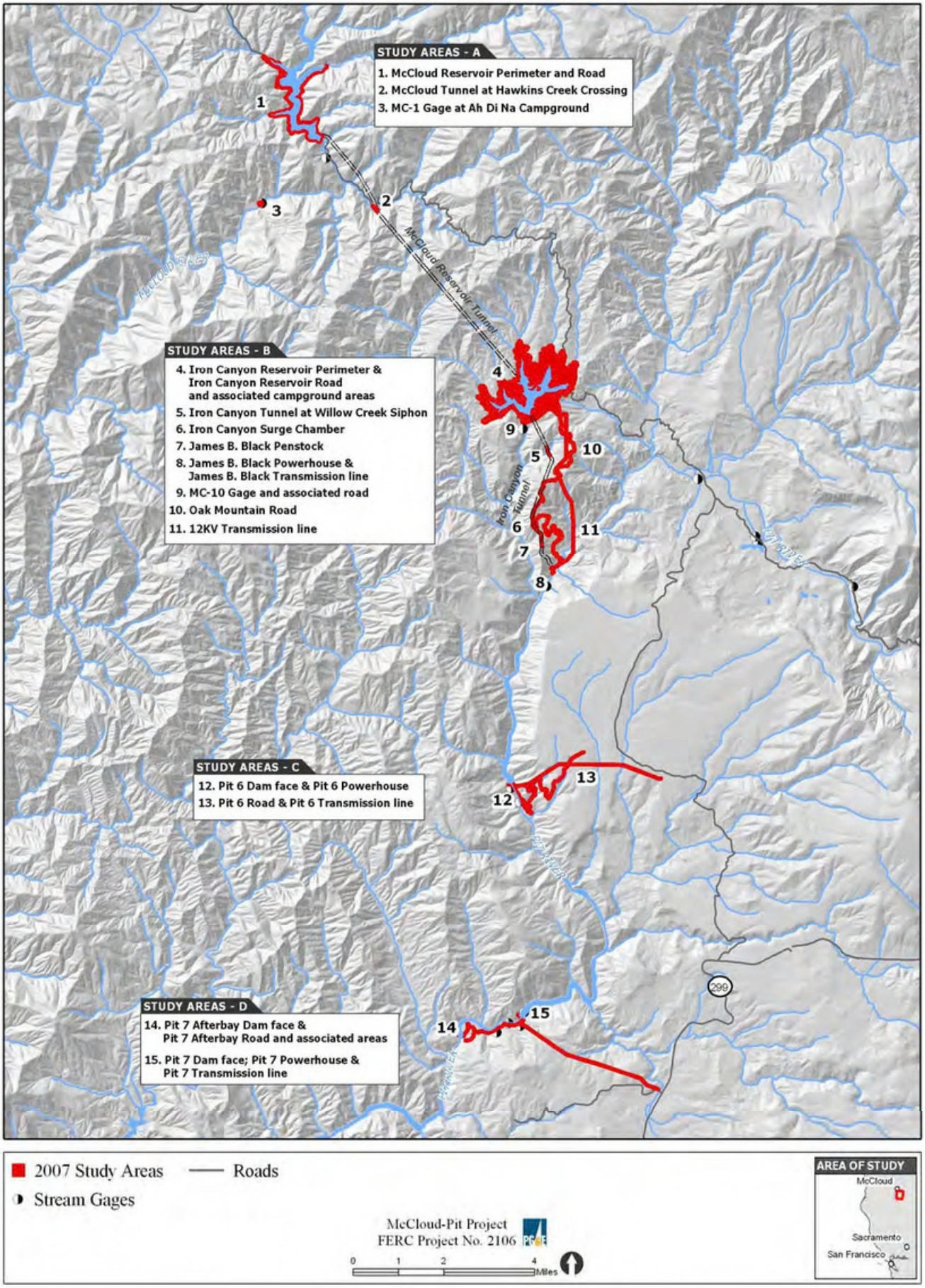

Figure 1. BR-S2 2007 Study Area overview map

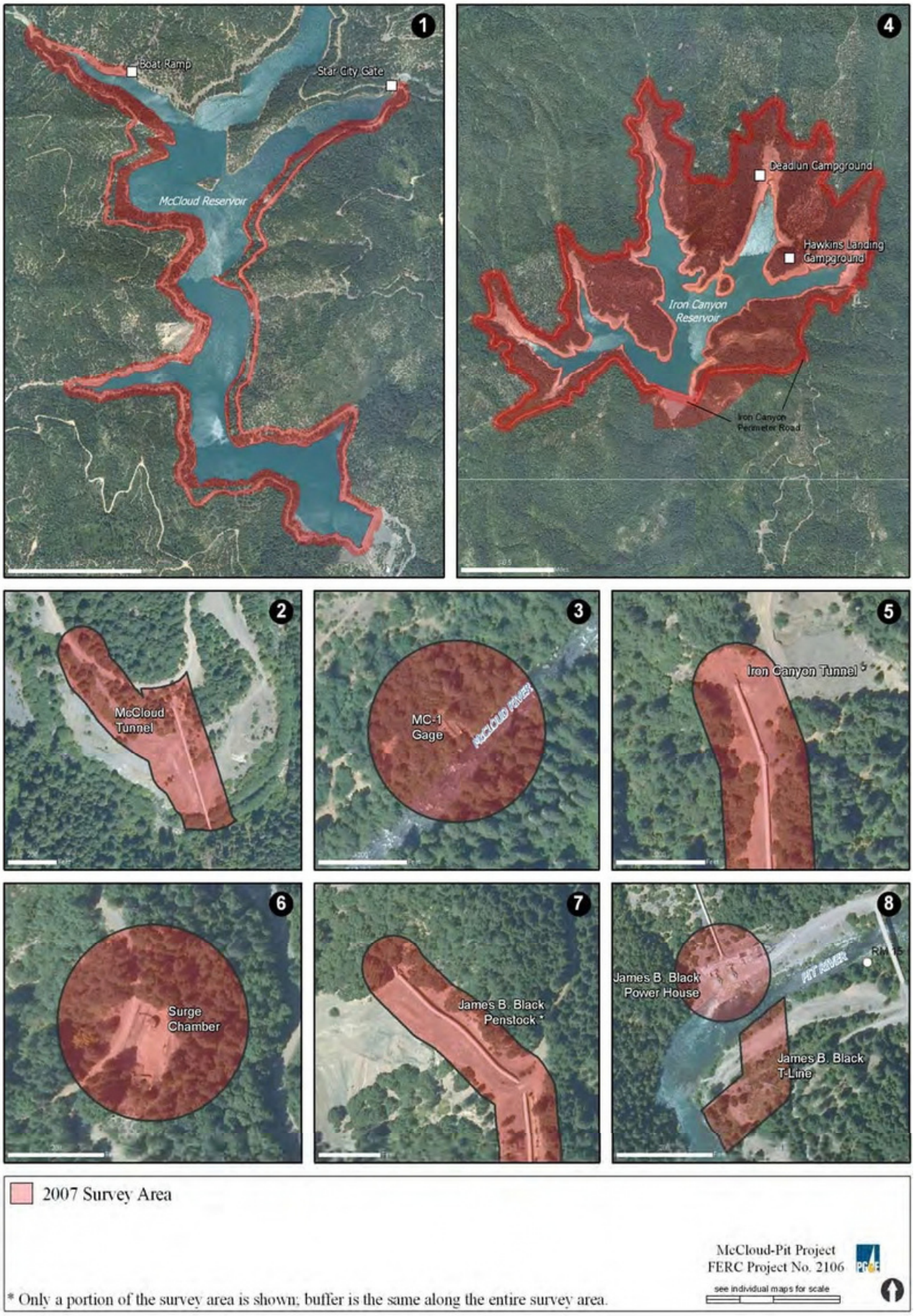

Figure 2. BR-S2 2007 Study Area detail maps

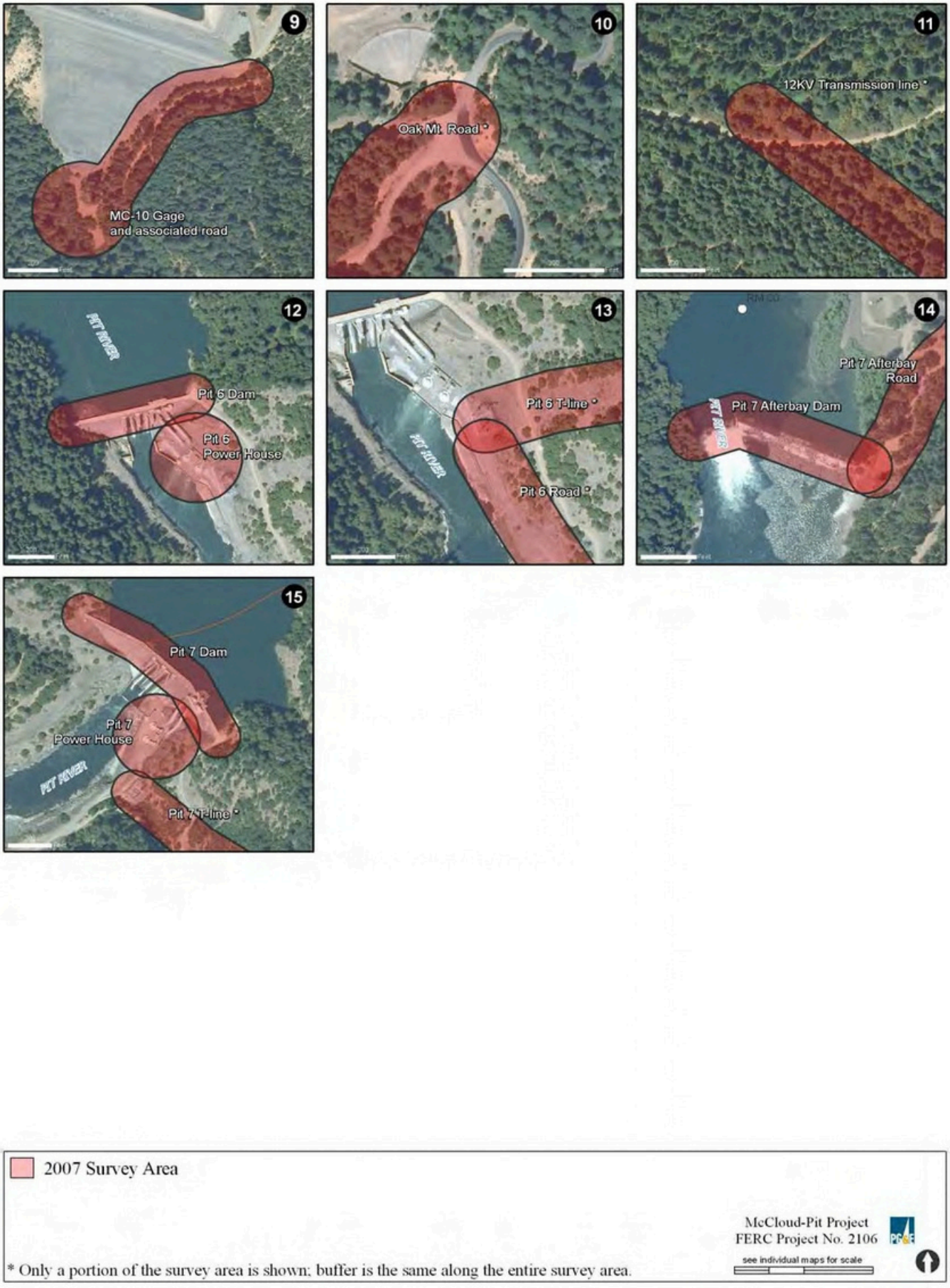

Figure 3. BR-S2 2007 Study Area detail maps

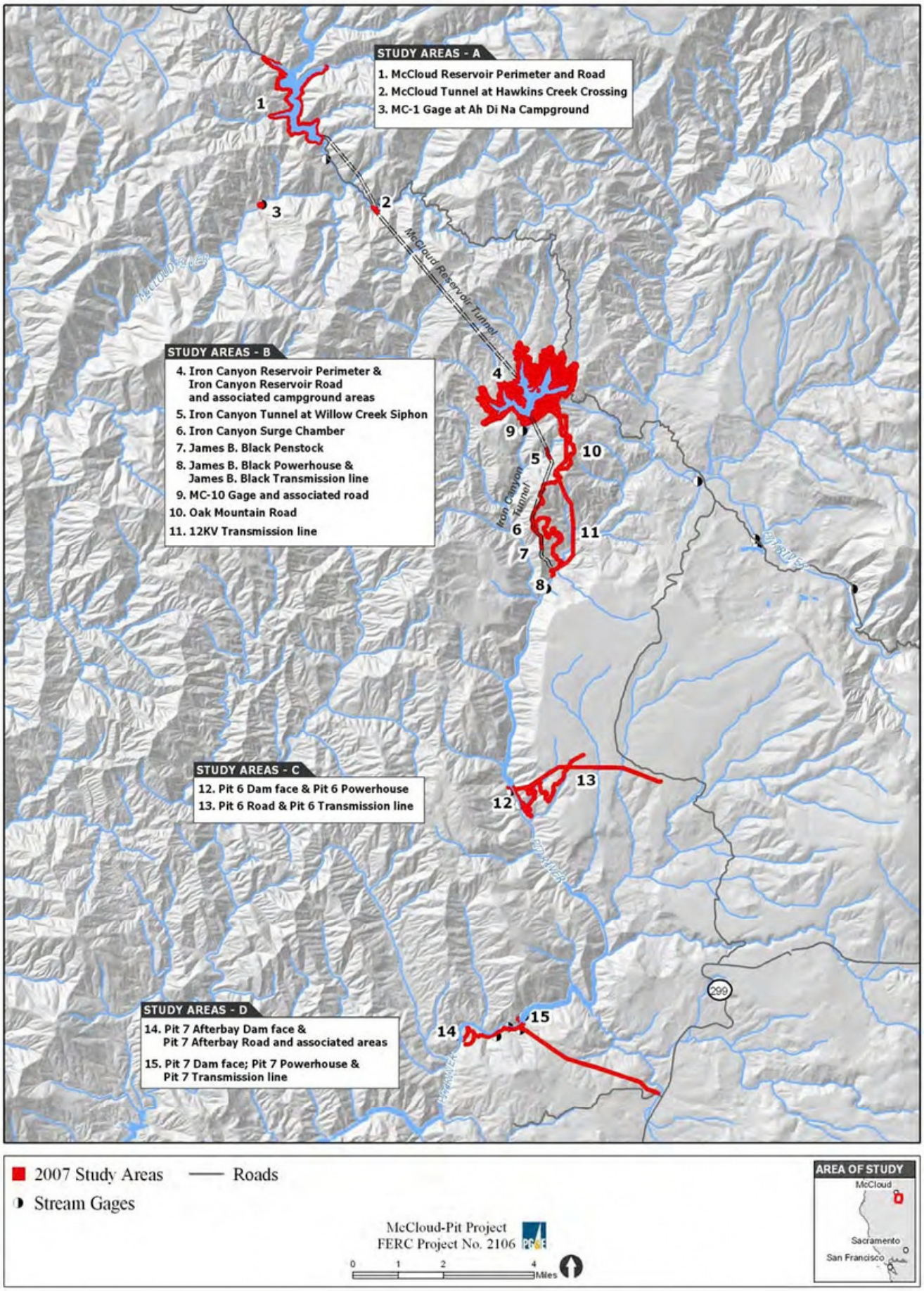

Figure 4. BR-S2 2008-2009 Study Area overview map

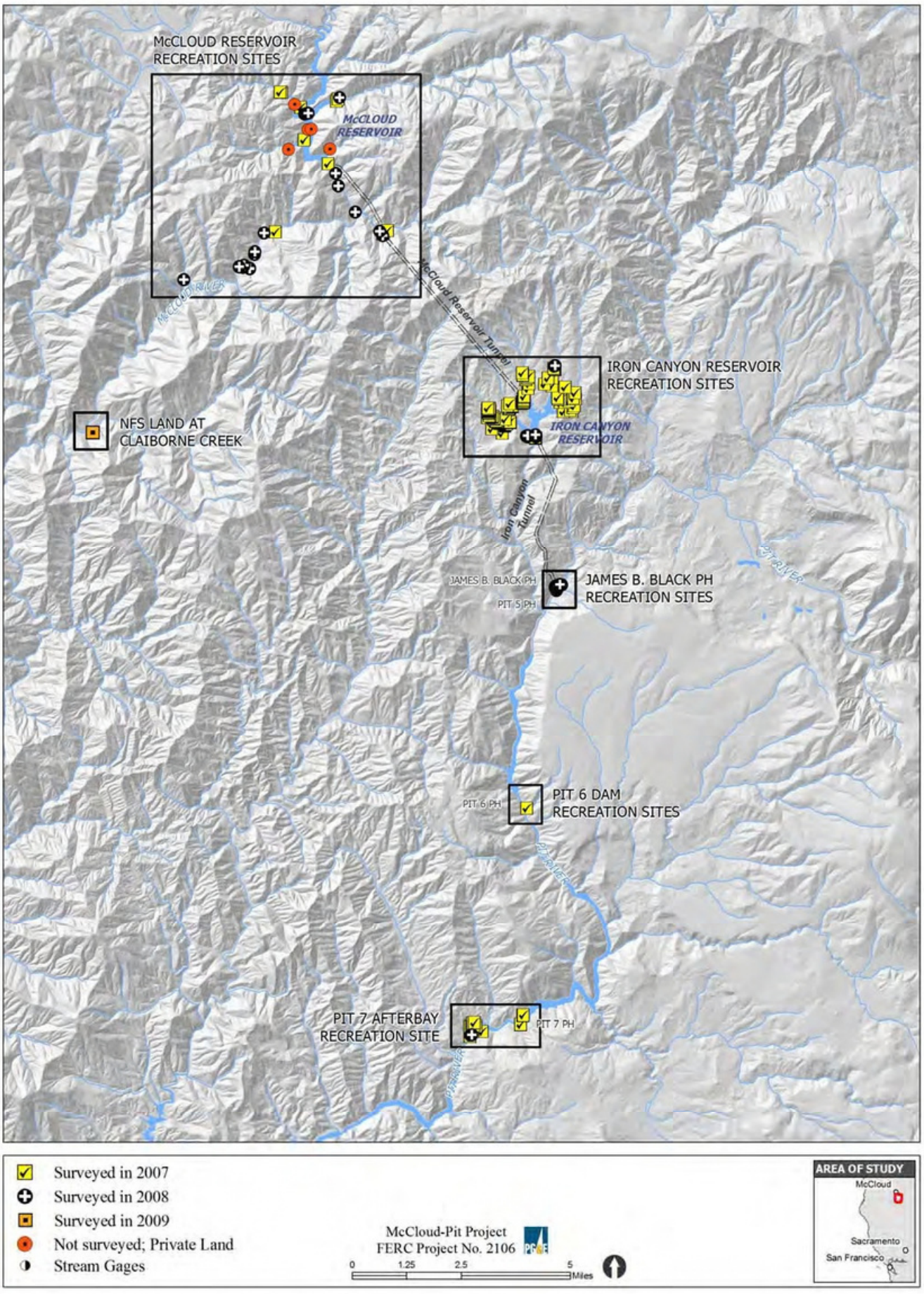

Figure 5. BR-S2 2008-2009 dispersed recreation sites Study Area overview map

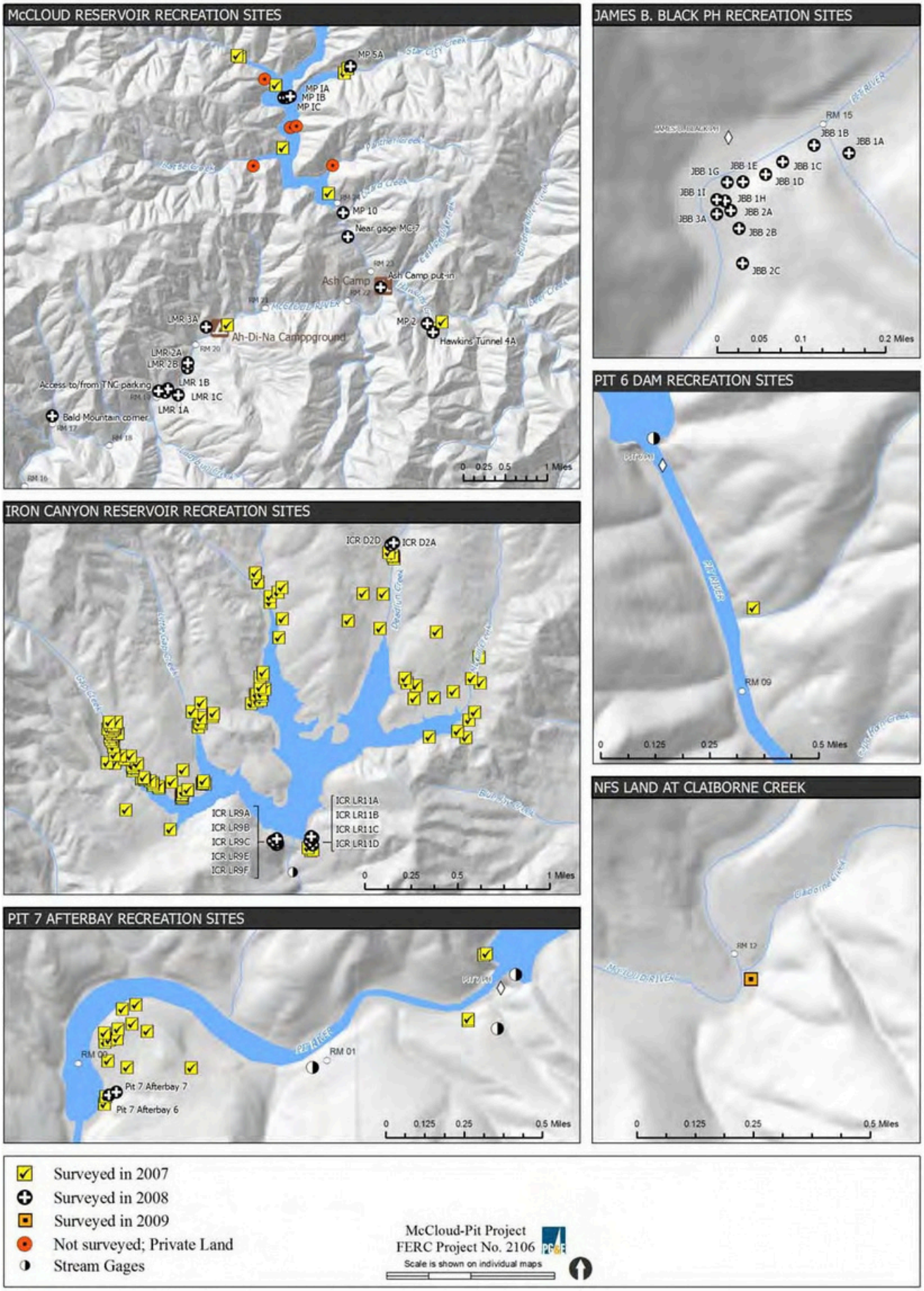

Figure 6. BR-S2 2008-2009 dispersed recreation sites Study Area detail maps

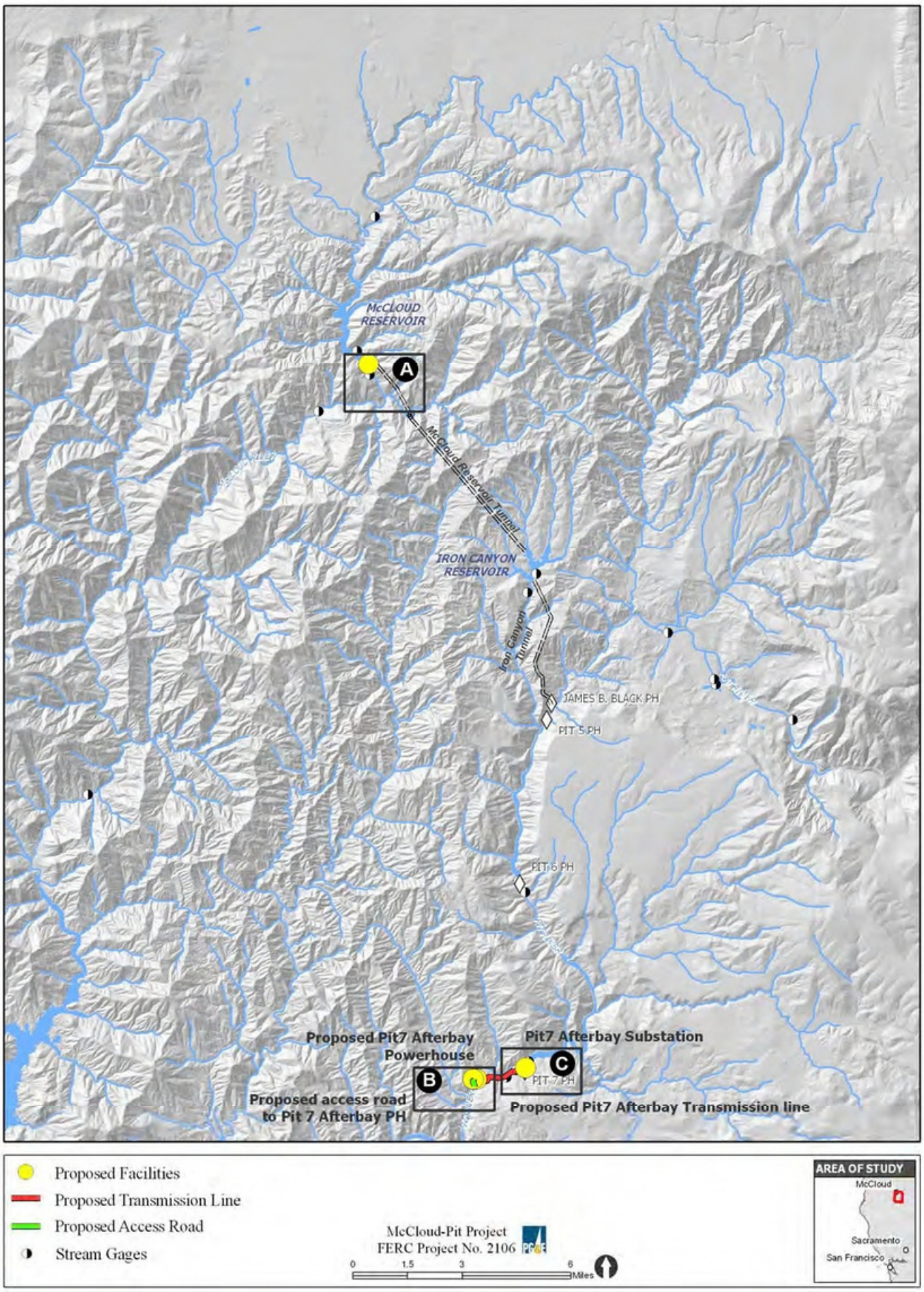

Figure 7. BR-S2 2008 proposed new construction Study Area overview map

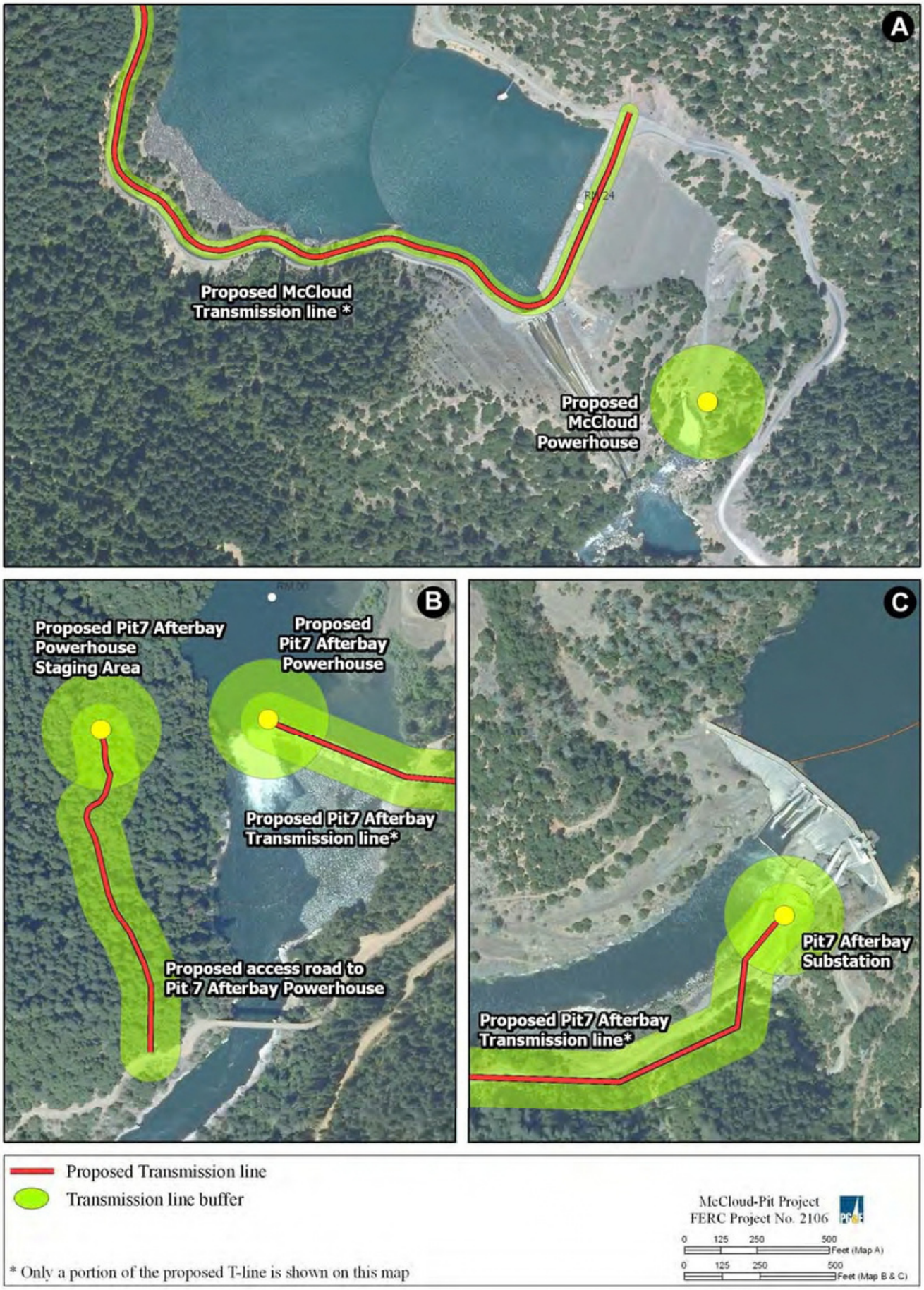

Figure 8. BR-S2 proposed new construction Study Area detail maps

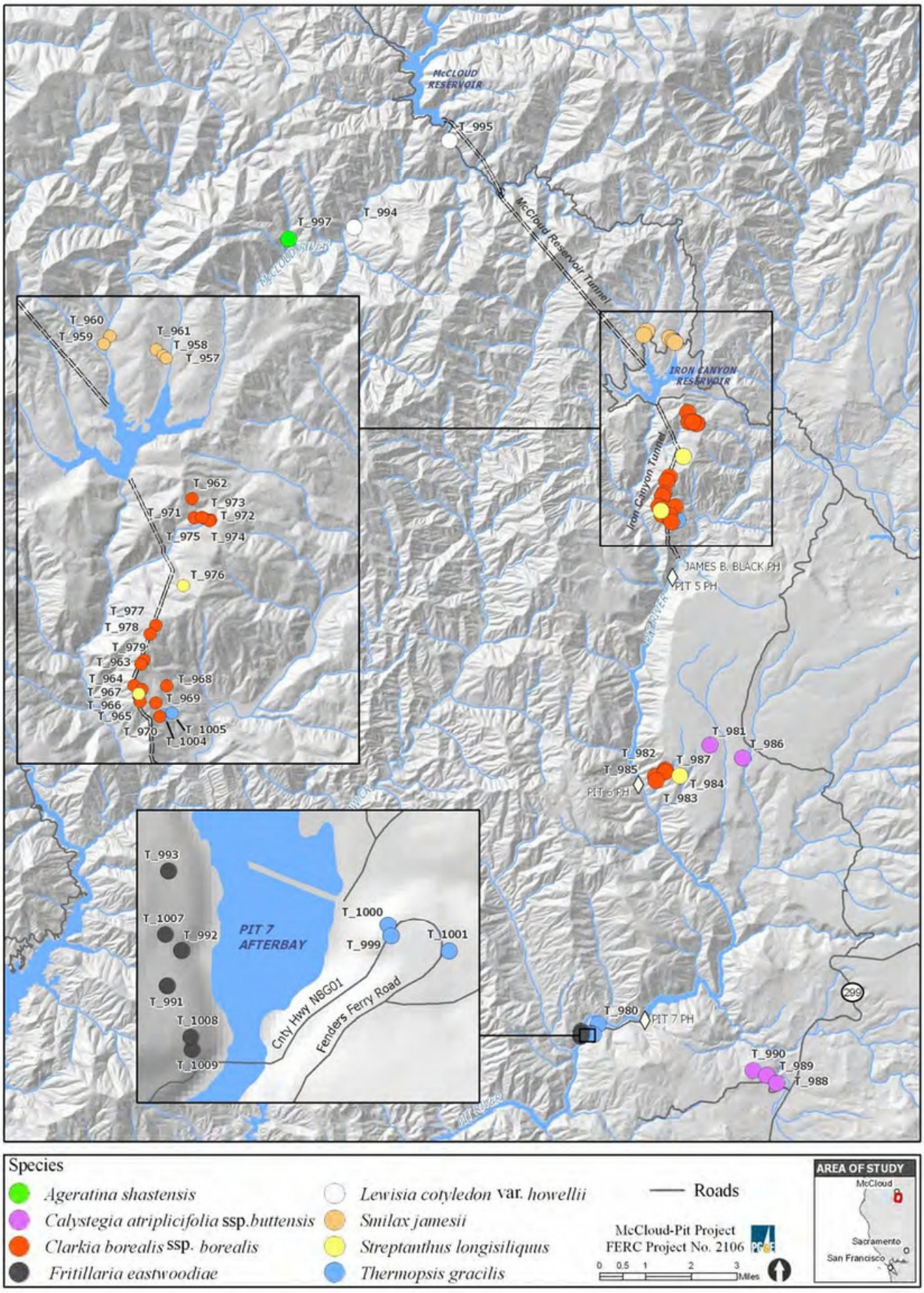

Figure 9. Special-status plant occurrences located in the Study Area, 2007–2009

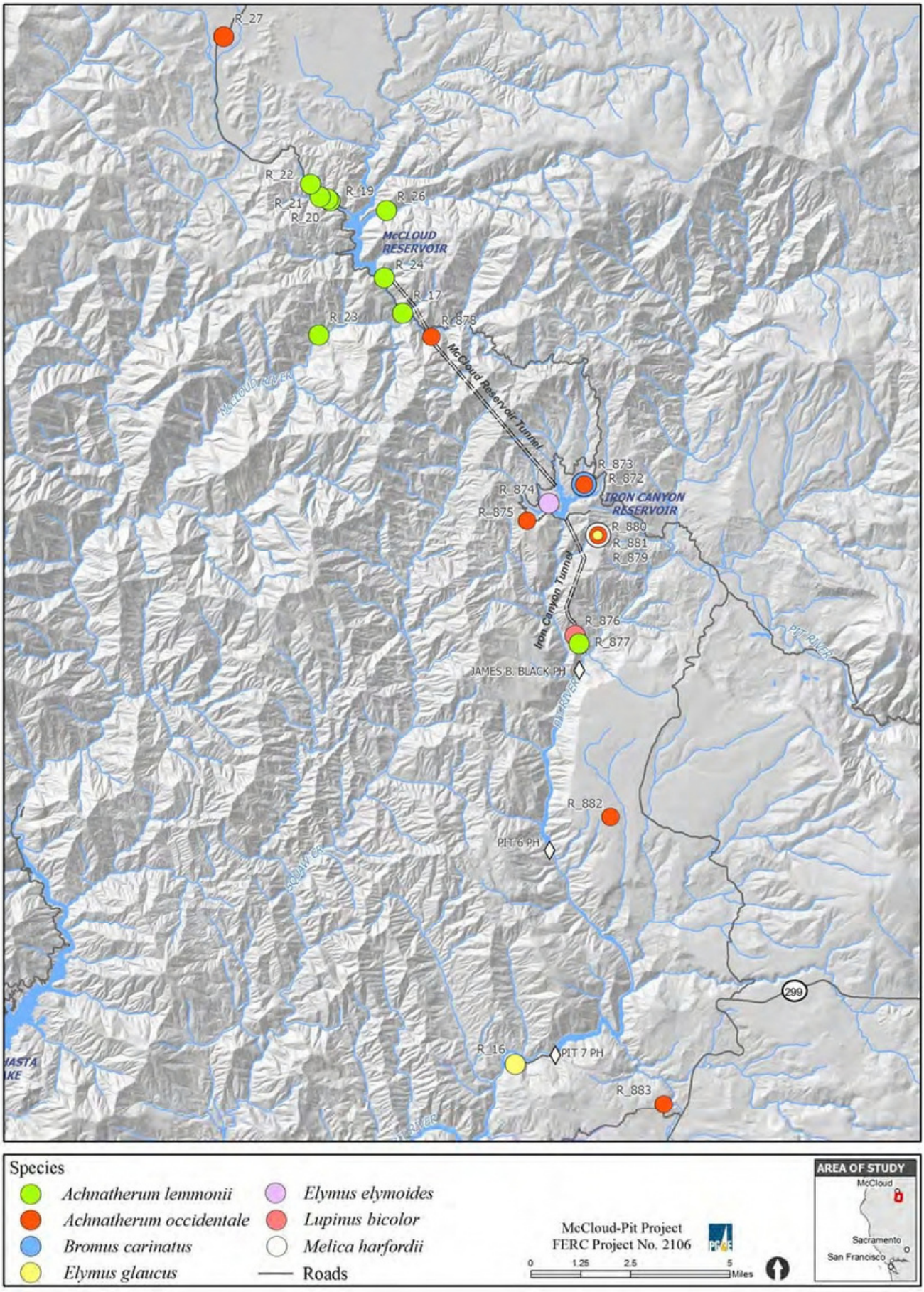

Figure 10. Native plant species populations suitable for revegetation material, located in 2007–2008

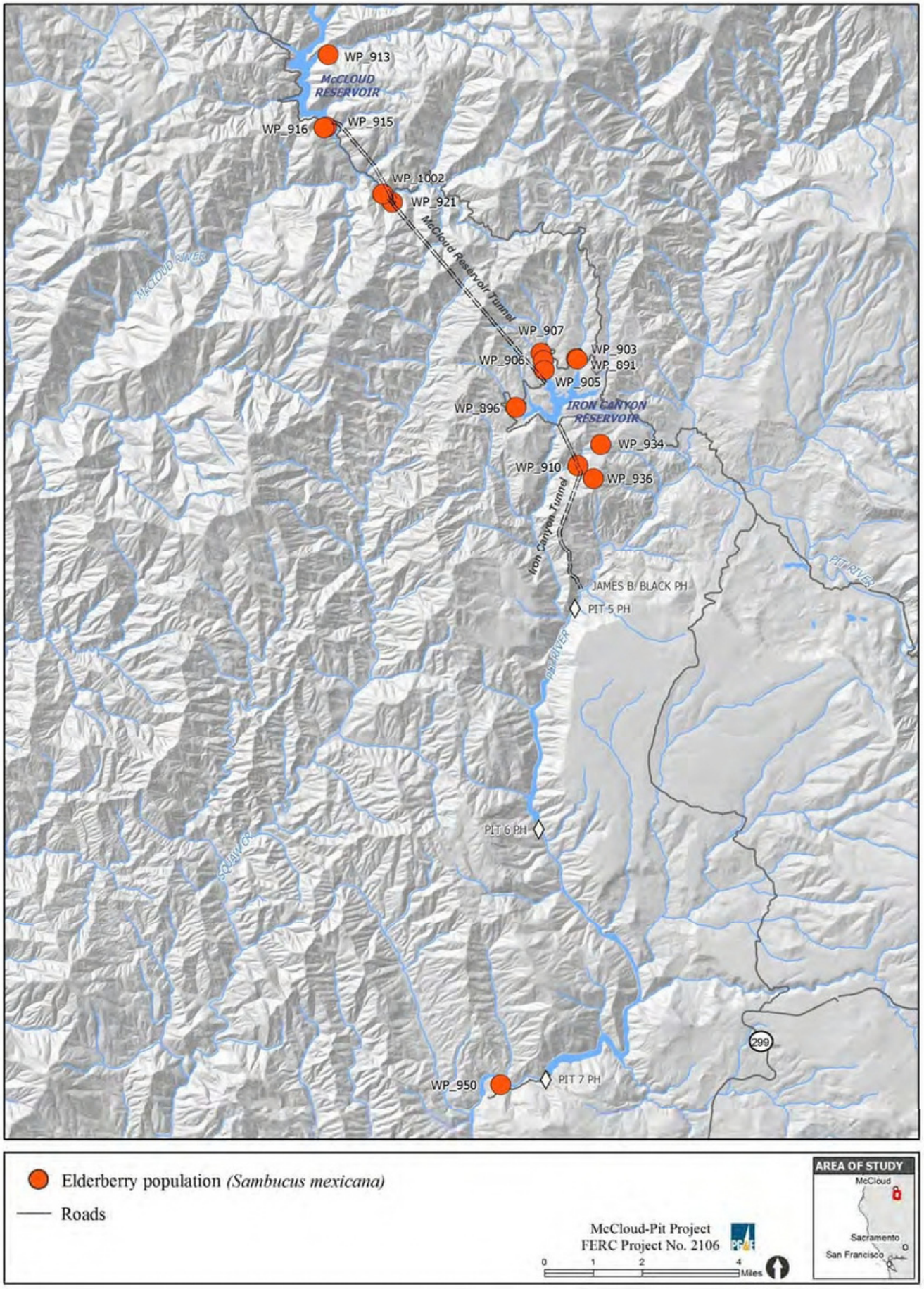

Figure 11. Elderberry *(Sambucus mexicana)* populations located in 2007–2008 surveys

ATTACHMENT 1

Special-StatusScoping List

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Attachment 1. Special-status scoping list

Scientific Name	CommonName(s)	QuerySources	Status Federal/State/CNPS/USFS/BLMa	Blooming Period[a]	Elevation Range m (ft)[a]	Suitable Habitat Type[a]	Likelihood of Occurrence in the 2007 Study Area?	Likelihood of Occurrence in the 2008 Study Area?
Vascular Plants								
Ageratina shastensis	Shasta eupatory; Shasta ageratina	USFS	–/–/List 4.2/FSE/–	Jun–Oct	400–1,800 (1,312–5,906)	Chaparral, lower montane, coniferous forest on rocky, carbonate soils	Yes	Yes
Agrostis hendersonii	Henderson's bent grass	CNPS; CNDDB	–/–/List 3.2/– /–	Apr–May	70–305 (230–1,001)	Mesic valley and foothill grassland; vernal pools	Yes	Yes
Anisocarpus scabridus(*Raillardiopsis scabrida* in the Jepson Manual[Hickman1993])	Scabrid alpine tarplant	USFS; CNPS; CNDDB; BLM	–/–/List 1B.3/FSS/BLMS	Jul–Aug	1,650–2,300 (5,413–7,546)	Upper montane coniferous forest on metamorphic, rocky soils	Yes	No; out of range
Arnica venosa	Veiny arnica; Shasta County arnica	USFS; BLM	–/–/List 4.2/FSE/–	May–Jul	400–1,490 (1,312–4,888)	Cismontane woodland; lower montane coniferous forest; often in disturbed areas including roadcuts	Yes	Yes
Asarum marmoratum	Marbled wild-ginger	CNPS; CNDDB	–/–/List 2.3/–/–	Apr–Aug	200–1,800 (656–5,906)	Lower montane coniferous forest	No; not scoped	Yes
Botrychium crenulatum	Scalloped moonwort	CNDDB; USFS	–/–/List 2.2/FSS/–	Jun–Sep	1,268–3,280 (4,160–10,761)	Bogs and fens; freshwater marshes and swamps; lower montane coniferous forest; meadows and seeps	Yes	No; out of range
Botrychium minganense	Mingan moonwort	USFS	–/–/List 2.2/FSS/–	Jul–Sep	1,500–2,055 (4,921–6,742)	Bogs and fens; lower montane coniferous forest; mesic upper montane coniferous forest	Yes	No; out of range
Botrychium pinnatum	Northwestern moonwort	USFS; CNPS; CNDDB	–/–/List 2.3/FSS/–	Jul–Oct	1,770–2,040 (5,807–6,693)	Lower montane coniferous forest; meadows and seeps; mesic upper montane coniferous forest	Yes	No; out of range
Botrychium virginianum	Rattlesnake fern	USFS; CNPS; CNDDB	–/–/List 2.2/FSS/–	Jun–Sep	730–1,300 (2,395–4,265)	Bogs and fens; mesic lower montane coniferous forest; meadows and seeps; riparian forest	Yes	Yes
Calochortus greenei	Greene's mariposa lily	CNPS; CNDDB; USFS; BLM	–/–/List 1B.2/FSS/BLMS	Jun–Aug	1,035–1,890 (3,396–6,201)	Cismontane woodland; meadows and seeps; pinyon and juniper woodland; upper montane coniferous forest on volcanic soils	Yes	Yes
Calochortus longebarbatus var. *longebarbatus*	long-haired star-tulip	USFS; CNPS; CNDDB; BLM	–/–/List 1B.2/FSS/BLMS	Jun–Aug	1,005–1,900 (3,297–6,234)	Great basin scrub; openings and drainages in lower montane coniferous forest; meadows and seeps; mesic vernal pools on clay soils	Yes	Yes

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Calochortus syntrophus	Callahan's mariposa lily	CNPS	–/–/List 3.1/– /–	May–Jun	525–886 (1,722–2,907)	Cismontane woodland; lower montane coniferous forest; vernally mesic valley and foothill grasslands	Yes	Yes
Calystegia atriplicifolia ssp. *buttensis*	Butte County morning-glory	USFS; CNPS; CNDDB; BLM	–/–/List 1B.2/FSS /BLMS	May–Jul	600–1,524 (1,969–5,000)	Chaparral; lower montane coniferous forest on rocky soils; roadsides	Yes	Yes
Campanula shetleri	Castle Crags harebell	CNPS; CNDDB; USFS; BLM	–/–/List 1B.3/FSS/BLMS	Jun–Sep	1,220–1,830 (4,003–6,004)	Lower montane coniferous forest on rocky soils	Yes	No; out of range
Campanula wilkinsiana	Wilkin's harebell; Wilken's bellflower	USFS; CNPS; CNDDB	–/–/List 1B.2/FSS/–	Jul–Sep	1,525–2,600 (5,003–8,530)	Meadows and seeps; subalpine coniferous forest; upper montane coniferous forest	Yes	No; out of range
Carex comosa	Bristly sedge	CNPS	–/–/List 2.1/– /–	May–Sep	0–625 (0–2,051)	Coastal prairie; marshes, swamps and lake margins; valley and foothill grassland	Yes	Yes
Carex halliana	Oregon sedge	CNPS	–/–/List 2.3/– /–	(May) Jul–Sep	1,370–2,105 (4,495–6,906)	Meadows and seeps, pinyon and juniper woodland, subalpine coniferous forest often on pumice	No; not scoped	No; out of range
Carex inops ssp. *inops*	Long-stoloned sedge	CNPS	–/–/List 3.3/– /–	Apr–Jul	680–2,000 (2,231–6,562)	Lower montane coniferous forest on rocky soils	Yes	Yes
Carex klamathensis	Sedge	USFS	–/–/List 1B.2/FSS /–	Not enough information	1,000–1,140 (3,281–3,740)	Chaparral, cismontane woodland, and serpentinite meadows and seeps	No; not scoped	Yes
Carex lasiocarpa	Slender sedge	CNPS; CNDDB	–/–/List 2.3/– /–	Jun–Jul	1,800–2,100 (5,906–6,890)	Bogs and fens; marshes and swamps; freshwater lake margins	Yes	No; out of range
Castilleja miniata ssp. *elata*	Siskiyou Indian paintbrush	CNPS; CNDDB	–/–/List 2.2/– /–	May–Aug	0–1,750 (0–5,741)	Bogs and fens; seeps in lower montane coniferous forest; often on serpentinite substrate	Yes	Yes
Chaenactis douglasii var. *alpina*	Alpine dusty maidens	CNPS; CNDDB	–/–/List 2.3/– /–	Jul–Sep	3,000–3,400 (9,843–11,155)	Alpine boulder and rock field; granitic soils	Yes	No; out of range
Chaenactis suffrutescens	Shasta chaenactis	USFS; CNPS; USFS; BLM	–/–/List 1B.3/FSS/BLMS	May–Sep	760–2,800 (2,493–9,186)	Lower montane coniferous forest; upper montane coniferous forest on sandy or serpentinite substrate	Yes	Yes

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Clarkia borealis ssp. *arida*	Shasta clarkia	CNPS; CNDDB; BLM	–/–/List 1B.1/– /BLMS	Jun–Aug	490–595 (1,608–1,952)	Cismontane woodland; gaps in lower montane coniferous forest	Yes	Yes
Clarkia borealis ssp. *borealis*	Northern clarkia	USFS; CNPS; CNDDB; BLM	–/–/List 1B.3/FSS/BLMS	Jun–Sep	400–1,340 (1,312–4,396)	Chaparral; cismontane woodland; lower montane coniferous forest	Yes	Yes
Collomia larsenii	Talus collomia	USFS	–/–/List 2.2/FSS/–	Jul–Sep(Oct)	2,210–3,500 (7,251–11,483)	Alpine boulder and rock field; closed-cone coniferous forest; subalpine coniferous forest; upper montane coniferous forest on volcanic talus	Yes	No; out of range
Cordylanthus tenuis ssp. *pallescens*	Pallid bird's-beak	CNPS; CNDDB; USFS; BLM	–/–/List 1B.2/FSS/BLMS	Jul–Sep	695–1,645 (2,280–5,397)	Lower montane coniferous forest on gravelly, volcanic alluvium	Yes	Yes
Cypripedium fasciculatum	Clustered lady's-slipper	USFS; BLM	–/–/List 4.2/FSS, SM/BLMS	Mar–Aug	100–2,435 (328–7,989)	Lower montane coniferous forest; North Coast coniferous forest; serpentinite seeps and streambanks	Yes	Yes
Cypripedium montanum	Mountain lady's-slipper	USFS; BLM	–/–/List 4.2/FSS, SM/BLMS	Mar–Aug	185–2,225 (607–7,300)	Broadleafed upland forest; cismontane woodland; lower montane coniferous forest; North Coast coniferous forest	Yes	Yes
Draba carnosula	Mt. Eddy draba	CNPS; CNDDB; USFS	–/–/List 1B.3/FSS/–	Jul–Aug	1,935–3,000 (6,348–9,843)	Subalpine coniferous forest; upper montane coniferous forest on serpentinite, rocky soils	Yes	No; out of range
Epilobium oreganum	Oregon fireweed; Grant's Pass willowherb	CNPS; CNDDB; USFS; BLM	–/–/List 1B.2/FSS/BLMS	Jun–Sep	500–2,240 (1,640–7,349)	Bogs and fens; lower montane coniferous forest; mesic, upper montane coniferous forest	Yes	Yes
Eriastrum tracyi (*E. brandegeeae* in the Jepson Manual [Hickman 1993])	Brandegee's eriastrum; Tracy's eriastrum; Brandegee's wooly-star	USFS; BLM	–/CR/List 1B.2/FSS/BLMS	Apr–Aug	305–1,030 (1,001–3,379)	Chaparral; cismontane woodland on volcanic and sandy soils	Yes	Yes
Ericameria ophitidis	Serpentine goldenbush	USFS	–/–/List 4.3/FSS/–	Jun–Aug	1,180–1,690 (3,871–5,545)	Chaparral; lower montane coniferous forest, generally on serpentinite soils	No; out of range	No; out of range
Erigeron maniopotamicus	Mad River fleabane daisy	USFS	–/–/List 1B.2/FSS/–	Jun–Aug	1,350–1,500 (4,429–4,921)	Lower montane coniferous forest; meadows and seeps; open, disturbed areas including road cuts; rocky soils	No; out of range	No; out of range

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Eriogonum alpinum	Trinity buckwheat	USFS	–/CE/List 1B.2/FSS/–	Jun–Sep	2,185–2,900 (7,169–9,514)	Alpine boulder and rock field; subalpine coniferous forest; upper montane coniferous forest on serpentinite and rocky soils	Yes	No; out of range
Eriogonum libertini	Dubakella Mountain buckwheat	USFS	–/–/List 4.2/–/–	Jun–Aug	1,200–1,720 (3,937–5,643)	Chaparral; lower montane coniferous forest on serpentinite soils	No; out of range	No; out of range
Eriogonum pyrolifolium var. *pyrolifolium*	Pyrola-leaved buckwheat	CNPS; CNDDB	–/–/List 2.3/– /–	Jul–Sep	1,675–3,200 (5,495–10,499)	Alpine boulder and rock field on sandy or gravelly, pumice substrate	Yes	No; out of range
Eriogonum ursinum var. *erubescens*	Sulphurflower buckwheat; blushing wild buckwheat	USFS; BLM	–/–/List 1B.3/FSS/BLMS	Jun–Sep	1,600–1,900 (5,249–6,234)	Chaparral montane; lower montane coniferous forest on rocky, scree, or talus substrate	Yes	No; out of range
Erythronium citrinum var. *roderickii*	Scott Mountains fawn lily; Roderick's fawn lily	USFS; BLM	–/–/List 1B.3/FSS/BLMS	Mar–Jun	650–1,460 (2,133–4,790)	Lower montane coniferous forest on serpentinite soils	Yes	Yes
Erythronium klamathense	Klamath fawn lily	CNPS; CNDDB	–/–/List 2.2/– /–	Apr–Jul	1,200–1,850 (3,937–6,070)	Meadows and seeps; upper montane coniferous forest	Yes	No; out of range
Eurybia merita	Subalpine aster	CNDDB	–/–/List 2.3/– /–	Late summer	1300–2,000 (4,265–6,562)	Upper montane coniferous forest	No; not scoped	No; out of range
Fritillaria eastwoodiae	Butte County fritillary	USFS; CNPS; CNDDB	–/–/List 3.2/FSS/–	Mar–Jun	50–1,500 (164–4,921)	Chaparral; cismontane woodland; openings in lower montane coniferous forest; sometimes on serpentinite soils	Yes	Yes
Geum aleppicum	Aleppo avens	CNPS; CNDDB	–/–/List 2.2/– /–	Jun–Aug	450–1,500 (1,476–4,921)	Great Basin scrub; lower montane coniferous forest; meadows and seeps	Yes	Yes
Harmonia doris-nilesiae	Niles's harmonial; Nile's madia	USFS; BLM	–/–/List 1B.1/FSS/BLMS	May–Jul	650–1,660 (2,133–5,446)	Chaparral; cismontane woodland; openings in lower montane coniferous forest on rocky soils, usually serpentinite	Yes	Yes
Harmonia stebbinsii	Stebbins's harmonia; Stebbin's madia	USFS; BLM	–/–/List 1B.2/FSS/BLMS	May–Jun	400–1,580 (1,312–5,184)	Chaparral; lower montane coniferous forest on serpentinite soils	Yes	Yes
Howellia aquatilis	Water howellia	USFS	FT/–/List 2.2/FSS/–	Jun	1,085–1,290 (3,560–4,232)	Freshwater marshes and swamps	Yes	Yes

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Hulsea nana	Little hulsea	CNPS; CNDDB	–/–/List 2.3/– /–	Jul–Aug	1,720–3,355 (5,643–11,007)	Alpine boulder and rock field; subalpine coniferous forest on rocky or gravelly, volcanic soils	Yes	No; out of range
Hymenoxys lemmonii	Alkali hymenoxys	CNPS; CNDDB	–/–/List 2.2/– /–	Jun–Aug	240–1,000 (787–3,281)	Great Basin scrub, lower montane coniferous forest, and subalkaline meadows and seeps	No; not scoped	Yes
Iliamna bakeri	Baker's globe mallow	USFS; CNDDB; BLM	–/–/List 4.2/FSS, SM/BLMS	Jun–Sep	1,000–2,500 (3,281–8,202)	Chaparral; Great Basin scrub; openings in lower montane coniferous forest; pinyon and juniper woodland on volcanic soils, often in burned areas	Yes	Yes
Iliamna latibracteata	California wild hollyhock; California globe mallow	CNPS; CNDDB; USFS	–/–/List 1B.2/FSS/–	Jun–Aug	60–2,000 (197–6,562)	Montane chaparral; lower montane coniferous forest; mesic, North Coast coniferous forest; riparian scrub; often in burned areas	Yes	Yes
Ivesia longibracteata	Castle Crags ivesia	CNPS; CNDDB; USFS; BLM	–/–/List 1B.3/FSS/BLMS	Jun	1,200–1,400 (3,937–4,593)	Lower montane coniferous forest on granitic, rocky soils	Yes	No; out of range
Ivesia pickeringii	Pickering's ivesia	USFS; BLM	–/–/List 1B.2/FSS/BLMS	Jun–Aug	800–1,510 (2,625–4,954)	Lower montane coniferous forest; mesic meadows and seeps, usually serpentinite soils	Yes	Yes
Juncus digitatis	Rush	USFS	–/–/–/Of Interest/–	Not enough information	670–760 (2,198–2,493)	Cedar ponderosa mixed forest or oak/mixed scrub; sandy, gravelly clay soils; near springs, in vernally moist areas [b]	No; not scoped	Yes
Leptosiphon nuttallii ssp. *howellii*	Mt. Tedoc linanthus; Mt. Tedoc leptosiphon	USFS	–/–/List 1B.3/FSS/–	May–Aug	1,220–2,800 (4,003–9,186)	Lower montane coniferous forest on serpentinite soils	Yes	No; out of range
Lewisia cantelovii	Cantelow's lewisia; wet cliff lewesia	USFS; CNPS; BLM	–/–/List 1B.2/FSS/BLMS	May–Oct	330–1,370 (1,083–4,495)	Broadleafed upland forest; chaparral; cismontane woodland; mesic, lower montane coniferous forest; granitic and sometimes serpentinite seeps	Yes	Yes
Lewisia cotyledon var. *howellii*	Howell's lewisia	CNPS	–/–/List 3.2/– /–	Apr–Jul	150–2,010 (492–6,594)	Broadleafed upland forest; chaparral; cismontane woodland; lower montane coniferous forest on rocky soils	Yes	Yes

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Limnanthes floccosa ssp. *bellingeriana*	Bellinger's meadowfoam	CNPS; CNDDB; BLM	–/–/List 1B.2/– /BLMS	Apr–Jun	290–1,100 (951–3,609)	Cismontane woodland; mesic meadows and seeps	Yes	Yes
Lomatium peckianum	Peck's lomatium	CNPS	–/–/List 2.2/– /–	Apr–May (Jun)	700–1,800 (2,297–5,906)	Chaparral, Cismontane woodland, Lower montane coniferous forest, Pinyon and juniper woodland/volcanic	No; not scoped	Yes
Lupinus elmeri	Greene Elmer's lupine; South Fork Mountain lupine	CNPS; USFS	–/–/List 1B.2/FSS, SM/–	Jun–Jul	1,370–2,000 (4,495–6,562)	Lower montane coniferous forest	Yes	Yes
Minuartia rosei	Peanut stitchwort; peanut sandwort	USFS	–/–/List 4.2/FSS/–	May–Jul	750–1,525 (2,461–5,003)	Lower montane coniferous forest on serpentinite soils	Yes	Yes
Minuartia stolonifera	Stolon sandwort; Scott Mountain Sandwort	USFS; BLM	–/–/List 1B.3/FSS/BLMS	May–Aug	1,250–1,400 (4,101–4,593)	Lower montane coniferous forest on serpentinite soils	Yes	No; out of range
Montia howellii	Howell's montia	USFS; BLM	–/–/List 2.2/FSS/BLMS	Mar–May	0–730 (0–2,395)	Meadows and seeps; North Coast coniferous forest; mesic vernal pools	Yes	Yes
Neviusia cliftonii	Shasta snow wreath; California snow wreath	USFS; CNPS; CNDDB; BLM	–/–/List 1B.2/FSS/BLMS	Apr–Jun	300–500 (984–1,640)	Cismontane woodland; lower montane coniferous forest; riparian woodland, often streamsides; sometimes carbonate, volcanic, or metavolcanic soils	Yes	Yes
Ophioglossum pusillum	Northern adder's-tongue	CNPS; CNDDB; USFS	–/–/List 2.2/FSS/–	Jul	1,000–2,000 (3,281–6,562)	Margins of marshes and swamps; mesic valley and foothill grassland	Yes	Yes
Orcuttia tenuis	Slender orcutt grass	USFS; BLM	FT/CE/List 1B.1/FSS/BLMS	May–Sep(Oct)	35–1,760 (115–5,774)	Vernal pools	Yes	Yes
Orthocarpus pachystachyus	Shasta orthocarpus	CNPS; CNDDB; BLM	–/–/List 1B.1/–/BLMS	May	840–850 (2,756–2,789)	Great Basin scrub, meadows and seeps, valley and foothill grassland	No; not scoped	Yes
Parnassia cirratavar. intermedia (*P.cirrata* in theJepson Manual [Hickman 1993])	Grass-of-Parnassus; fringed grass of Parnassus	CNPS; CNDDB; USFS; BLM	–/–/List 2.2/FSS/BLMS	Jul–Sep	780–1,980 (2,559–6,496)	Bogs and fens; meadows and seeps; rocky, serpentine soil	Yes	Yes
Penstemon filiformis	Thread-leaved beardtongue	CNPS; CNDDB; USFS; BLM	–/–/List 1B.3/FSS/BLMS	May–Jul (Sep)	450–1,830 (1,476–6,004)	Cismontane woodland; lower montane coniferous forest on rocky soils	Yes	Yes

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Phacelia cookei	Cooke's phacelia	CNPS; CNDDB; USFS; BLM	–/–/List 1B.1/FSS/BLMS	Jun–Jul	1,095–1,700 (3,593–5,577)	Great Basin scrub; lower montane coniferous forest on sandy or volcanic soils	Yes	Yes
Phacelia dalesiana	Scott Mountain phacelia	CNDDB	–/–/List 4.3/–/–	May–Jul	1025–2,105 (3,363–6,906)	Lower montane coniferous forest, meadows and seeps, subalpine coniferous forest, and serpentinite soils in upper montane coniferous forest	No; not scoped	Yes
Phacelia greenei	Scott Valley phacelia	USFS; BLM	–/–/List 1B.2/FSS/BLMS	Apr–Jun	800–2,440 (2,625–8,005)	Closed-cone coniferous forest; lower montane coniferous forest; subalpine coniferous forest; upper montane coniferous forest on serpentinite soils	Yes	Yes
Picea engelmannii	Engelmann spruce	CNPS; CNDDB	–/–/List 2.2/– /–	N/A	1,065–2,135 (3,494–7,005)	Upper montane coniferous forest	Yes	No; out of range
Pinguicula vulgaris ssp. *macroceras*	Horned butterwort	CNPS; CNDDB	–/–/List 2.2/– /–	Apr–Jun	40–1,920 (131–6,299)	Bogs and fens, often serpentinite	No; not scoped	Yes
Polemonium chartaceum	Mason's sky pilot	USFS	–/–/List 1B.3/FSS/–	Jun–Aug	1,800–4,200 (5,906–13,780)	Alpine boulder and rock field; subalpine coniferous forest on rocky, serpentinite, granitic, or volcanic soils	Yes	No; out of range
Polystichum lonchitis	Northern holly fern	CNPS	–/–/List 3/–/–	Jun–Sep	1,800–2,800 (5,906–9,186)	Subalpine coniferous forest, granitic or carbonate soils in upper montane coniferous forest	No; not scoped	No; out of range
Potentilla cristae	Crested potentilla	CNPS	–/–/List 1B.3/–/–	Aug–Sep	1,800–2,800 (5,906–9,186)	Alpine boulder and rock field, seasonally mesic subalpine coniferous forest, often serpentinite seeps, gravelly or rocky soils	No; not scoped	No; out of range
Puccinellia howellii	Howell's alkali grass	USFS; BLM	–/–/List 1B.1/FSS, SM/BLMS	Apr–Jun	490–490 (1,608–1,608)	Mineralized meadows and seeps	Yes	Yes
Raillardella pringlei	Showy raillardella	USFS; BLM	–/–/List 1B.2/FSS/BLMS	Jul–Sep	1,200–2,290 (3,937–7,513)	Bogs and fens; meadows and seeps; mesic, upper montane coniferous forest on serpentinite soils	Yes	No; out of range
Rorippa columbiae	Columbia yellow cress	USFS; CNPS; BLM	–/–/List 1B.2/FSS/BLMS	May–Sep	1,200–1,800 (3,937–5,906)	Meadows and seeps; pinyon and juniper woodland; mesic playas	Yes	No; out of range

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Scutellaria galericulata	Marsh skullcap	CNPS; CNDDB	–/–/List 2.2/–/–	Jun–Sep	0–2,100 (0–6,890)	Lower montane coniferous forest, mesic meadows and seeps, marshes and swamps	No; not scoped	Yes
Sedum paradisum	Canyon Creek stonecrop	USFS; BLM	–/–/List 1B.3/FSS/BLMS	May–Jun	300–1,860 (984–6,102)	Broadleaved upland forest; chaparral; lower montane coniferous forest; subalpine coniferous forest on granitic, rocky soils	Yes	Yes
Silene campanulata ssp. *campanulata*	Red Mountain catchfly	USFS; BLM	–/CE/List 4.2/FSS, SM/BLMS	Apr–Jul	425–2,085 (1,394–6,841)	Chaparral; lower montane coniferous forest, usually on rocky serpentinite soils	Yes	Yes
Silene occidentalis ssp. *longistipata*	Long-stiped campion	USFS; CNPS; CNDDB; BLM	–/–/List 1B.2/FSS/BLMS	Jun–Aug	1,000–2,000 (3,281–6,562)	Chaparral; lower montane coniferous forest; upper montane coniferous forest	Yes	Yes
Silene salmonacea	Klamath Mountain catchfly	USFS	–/–/List 1B.2/FSS/–	Jun	775–1,045 (2,543–3,429)	Lower montane coniferous openings; often serpentenite	No; not scoped	Yes
Silene suksdorfii	Cascade alpine campion	CNPS; CNDDB	–/–/List 2.3/– /–	Jul–Sep	2,355–3,110 (7,726–10,203)	Alpine boulder and rock field; subalpine coniferous forest; upper montane coniferous forest on volcanic, rocky soils	Yes	No; out of range
Smilax jamesii	English Peak greenbriar	USFS; CNPS; CNDDB; BLM	–/–/List 1B.3/FSS/BLMS	May–Jul (Aug)	580–2,500 (1,903–8,202)	Broadleafed upland forest; lower montane coniferous forest; marshes and swamps; North Coast coniferous forest; upper montane coniferous forest on streambanks and lake margins	Yes	Yes
Streptanthus longisiliquus	long-fruit jewel-flower	USFS	–/–/List 4.3/FSS/–	Apr–Sep	715–1,500 (2,346–4,921)	Cismontane woodland and openings in lower montane coniferous forest	No; not scoped	Yes
Swertia umpquaensis (*Frasera umpquaensis* in the Jepson Manual [Hickman 1993])	Umpqua swertia; Umpqua green gentian	USFS	–/–/List 2.2/FSS/–	Jun–Jul	1,555–1,900 (5,102–6,234)	Chaparral; lower montane coniferous forest; meadows and seeps; North Coast coniferous forest	Yes	Yes
Trifolium siskiyouense	Siskiyou clover	CNPS	–/–/List 3.2/–/–	Jun–Jul	880–1,500 (2,887–4,921)	Mesic meadows and seeps	No; not scoped	Yes
Trimorpha acris var. *debilis*	Snow fleabane daisy	CNPS	–/–/List 2.3/–/–	Jul–Aug	1,735–2,900 (5,692–9,514)	Alpine boulder and rock fields; meadows and seeps; and rocky, volcanic subalpine coniferous forest	No; not scoped	No; out of range
Vaccinium scoparium	Little-leaved huckleberry	CNPS	–/–/List 2.2/–/–	Jun–Aug	1,036–2,200 (3,399–7,218)	Rocky supalpine coniferous forest	No; not scoped	Yes

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Attachment 1. Special-status scoping list

Scientific Name	CommonName(s)	QuerySources	Status Federal/State/CNPS/USFS/BLMa	Blooming Period[a]	Elevation Range m (ft)[a]	Suitable Habitat Type[a]	Likelihood of Occurrence in the 2007 Study Area?	Likelihood of Occurrence in the 2008 Study Area?
Viburnum edule	Squashberry	USFS	–/–/–/Of Interest/–	Late spring	300–900 (980–2,950)[c]	Chaparral, yellow pine forest[c]	No; not scoped	Yes
Viburnum ellipticum	Oval-leaved viburnum	CNPS; CNDDB	–/–/List 2.3/– /–	May–Jun	215–1,400 (705–4,593)	Chaparral; cismontane woodland; lower montane coniferous forest	Yes	Yes
Lichens								
Hydrothyria venosa (*Peltigera hyrothyria* in Lichensof California [Hale and Cole 1988])	Veined water lichen	USFS	–/–/– /FSS/–	NA	1,524–2,133 (5,000–7,000)[d]	On stones or gravel submerged or partially submerged in small streams in montane and subalpine forest[d]	Yes	No; out of range
Leptogium siskiyouensis	Skin lichen	USFS	–/–/–/Of Interest/–	NA	396–1,463 (1,300–4,800)	Epiphytic on the smooth bark of young oak trunks or oak branches, particularly *Quercus kelloggii.* It has also been found in Shasta County on *Fraxinus latifolia.*[e]	No; not scoped	Yes
Sulcaria badia	Bay horsehair lichen	USFS	–/–/– /FSS/–	NA	304–609 (1,000–2,000)[d]	On oaks and conifers in North Coastal forest[d]	Yes	Yes
Bryophytes								
Buxbaumia viridis	Green shield-moss; green bug-on-a-stick	USFS; BLM	–/–/– /FSS/BLMS	NA	high (subalpine) elevations	Decorticated wood or humus banks in coniferous forests[f]	No; out of range	No; out of range
Meesia triquetra	Three-ranked hump-moss	USFS; CNDDB	–/–/List 4.2/FSS/–	NA	1,300–2,953 (4,265–9,688)	Bogs and fens; meadows and seeps; subalpine coniferous forest; mesic, upper montane coniferous forest	No; out of range	No; out of range
Meesia uliginosa	Broad-nerved hump-moss	USFS; CNDDB; CNPS	–/–/List 2.2/FSS/–	NA	1,300–2,804 (4,265–9,199)	Bogs and fens; meadows and seeps; subalpine coniferous forest; upper montane coniferous forest on damp soils	No; out of range	No; out of range
Mielichhoferia elongata	Elongate copper-moss	USFS	–/–/List 2.2/FSS/–	NA	500–1,300 (1,640–4,265)	Cismontane woodland on metamorphic rock, usually vernally mesic areas	Yes	Yes
Ptilidium californicum	Pacific fuzzwor; leafy liverwort	USFS; BLM	–/–/– /FSS/BLMS	NA	914– 1524 (3,000–5,000)[g]	Epiphytic on coniferous tree trunks, decaying logs, stumps and rarely on humus over rock[h]	Yes	Yes

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Attachment 1. Special-status scoping list

Scientific Name	CommonName(s)	QuerySources	Status Federal/State/CNPS/USFS/BLMa	Blooming Period[a]	Elevation Range m (ft)[a]	Suitable Habitat Type[a]	Likelihood of Occurrence in the 2007 Study Area?	Likelihood of Occurrence in the 2008 Study Area?
Trichodon cylindricus	Cylindrical trichodon	CNPS	–/–/List 2.2/–/–	NA	50–2,000 (164–6,562)	Broadleafed upland forest; meadows and seeps, sandy soils in upper montane coniferous forest; exposed soil; roadbanks	No; not scoped	Yes
Fungi								
Boletus pulcherrimus	Red-pored bolete	USFS	–/–/– /FSS/–	NA	NA	Mixed woods; coniferous forests[f] ~~Coniferous forests[f]~~ ~~Old decayed or blackened mushrooms (Russula albonigra);~~ coniferous duff[f]	Yes	Yes
Cudonia monticola	Mountain cudonia	USFS	–/–/– /FSS/–	NA	NA		Yes	Yes
Dendrocollybiaracemosa (*Collybia racemosa*in Mushrooms Demystified [Arora 1986])	Branched collybia	USFS; BLM	–/–/–/FSS/BLMS	NA	NA		Yes	Yes
Phaeocollybiaolivacea	Olive phaeocollybia	USFS; BLM	–/–/–/FSS/BLMS	NA	NA	Woodlands; coniferous forests[f]	Yes	Yes
Sowerbyellarhenana (*Aleuria rhenana*in Mushrooms Demystified [Arora 1986])	False orange peel	USFS; BLM	–/–/–/FSS/BLMS	NA	NA	Coniferous forests[f]	Yes	Yes

Notes: Federal – Federal Endangered Species Act
FT – Federally listed threatened
State – California Endangered Species Act
CE – State endangered
CNPS – California Native Plant Society
List 1B – Rare, threatened, or endangered in CA and elsewhere
List 2 – Rare, threatened, or endangered in CA but common elsewhere
List 3 – We need more information about this plant (Review List)
List 4 – Limited Distribution (Watch List)
0.1 Seriously endangered in CA
0.2 Fairly endangered in CA
0.3 Not very endangered in CA
USFS – United States Forest Service
FSS – Forest Service Sensitive
FSE – Forest Service Endemic
SM – Northwest Plan Survey and Manage List
BLM – Bureau of Land Management
BLMS – BLM Sensitive species

[a] Unless otherwise noted, information from California Native Plant Society (CNPS). 2008. Inventory of Rare and Endangered Plants (online edition, v7-08a). http://www.cnps.org/inventory. Accessed on November 24, 2008. CNPS. Sacramento, California.

[b] Personal communication, J. Nelson, District Botanist, USFS, Redding, CA, and N. Jurjavcic, Botanist, Stillwater Sciences, Berkeley, CA, June 8, 2007.

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Attachment 1. Special-status scoping list

[c] Draft: Second Edition ofthe Jepson Manual.2008. http://ucjeps.berkeley.edu/tjm2/review/treatments/adoxaceae.html#48018

[d] Hale, M. E., Jr. and M. Cole. Lichens of California. University of California Press, Berkeley, California.

[e] BLM and USDA (U.S. Department of Agriculture) Forest Service. 2006. Leptogium cyanescens - a catchall name for gray isidiate Leptogium species in the Pacific Northwest? http://www.fs.fed.us/r6/sfpnw/issssp/documents/inventories/20060401-leptogium-study-interim-report-stone-ruchty.doc Accessed on November 21, 2008.

[f] Arora, D. 1986. Mushrooms Demystified: A Comprehensive Guide to Fleshy Fungi. Second Edition. Ten Speed Press. Berkeley, California.

[g] Christy, J. A. and D. H. Wagner. 1996. Guide for the identification of rare, threatened or sensitive bryophytes in the range of the northern spotted owl, western Washington, western Oregon, and northwestern California. A cooperative project of the Eugene District, U.S. Department of Interior Bureau of Land Management; Siuslaw National Forest, U.S. Forest Service; The Nature Conservancy; and the Northwest Botanical Institute. Bureau of Land Management, Oregon-Washington State Office. Portland, Oregon.

[h] BLM and USDA (U.S. Department of Agriculture) Forest Service. 1997. Survey and Manage Survey Protocols – Bryophytes: Survey Strategy 2 Protocol for Ptilidium californicum (Aust.) Underw. Version 2.0. http://www.blm.gov/or/plans/surveyandmanage/SP/Bryophytes/ptilidium.html. Accessed on January 7, 2007.

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ATTACHMENT 2

Comprehensive Species List

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Attachment 2. Comprehensive Species List

Hickman 1993 Scientific Name	Common Name	Family						Existing Project Study Area Feature																																Proposed Infrastructure	
								Transmission Lines						Roads						Tunnels			Canals		Project Facilities							Reser-voirs		Dispersed Recreation Sites							Iron Canyon Reservoir Recreation Sites			
								Pit 6 Transmission Line	Pit 7 Transmission Line	12KV Transmission Line Oak Mountain Road	Targeted Weed?	JB Black Transmission Line	Voucher? (site of collection or observation)	Special Status Native?	Pit 6 Road	Pit 7 Road	Reveg?	[illegible]	Pit 7 Afterbay Road and Associated Areas	Iron Canyon Reservoir Road and Associated	Iron Canyon Spillway to Kosk Creek Road	James B. Black Powerhouse	McCloud Tunnel at Hawkins Creek	[illegible]	Iron Canyon Tunnel at Willow Creek Siphon	Pit 7 Powerhouse James B. Black Penstock	[illegible]	[illegible]	[illegible]

Attachment 2. Comprehensive Species List

Hickman 1993 Scientific Name	Common Name	Family	Special Status Native?	Targeted Weed?	Voucher? (site of collection)	Pit 6 Transmission Line	Pit 7 Transmission Line	12KV Transmission Line	Oak Mountain Road	JB Black Transmission Line	Pit 6 Road	Pit 7 Road	Existing Project Study Area Feature: Lines	Roads					Tunnels			Gages	Project Facilities							Reservoirs		Dispersed Recreation Sites						Iron Canyon Reservoir Recreation Sites		Proposed Infrastructure	
												Reveg?		a		Pit 7 Afterbay Road and Associated Areas	Iron Canyon Regulating Pond and Associated Road	Iron Canyon Spillway to Kosk Creek Road	James B. Black Powerhouse	McCloud Tunnel at Hawkins Creek	Iron Canyon Tunnel at Willow Creek Siphon	Pit 7 Powerhouse James B. Black Penstock																	
Ageratina occidentalis	western snakeroot	Asteraceae	Y	N	N	N	N	Y								X	X												X		X	X*						X
Ageratina shastensis	Shasta eupatorium	Asteraceae	Y	Y	N	N	N	Y																								X*						
Agoseris grandiflora	bigflower agoseris annual agoseris	Asteraceae	Y Y	N N	N N	N N	N N											X													X			X	X	X		
Agoseris heterophylla	spearleaf agoseris	Asteraceae	Y N	N	N	N	N																												X X				
Agoseris retrorsa	agoseris	Asteraceae	Y	N	N	N	N					X	X	X	X	X			X	X	X	X								X	X			X	X		X	X	
Agoseris sp.	~~colonial bentgrass~~	~~Poaceae~~	N	N	N	N	N					X																				X	X			X			
Agrostis capillaris *Agrostis exarata*	spike bentgrass	Poaceae	Y Y	N	N	N	N	Y																						X					*			
Agrostis gigantea	~~redtop~~	~~Poaceae~~		N	N	N	N	Y			X	X	X	X	X	X		X	*				X							X				X	X		X	
Agrostis pallens				N	Y	N	N								X																								
Agrostis scabra	seashore bentgrass	Poaceae		N	N	N	N	Y							X																	X			*			
Agrostis sp. [not *A. hendersonii*]	rough bentgrass	Poaceae		N	N	N	N																															
Agrostis stolonifera	bentgrass	Poaceae		N	N	N	N							X																								
Agrostis thurberiana	creeping bentgrass	Poaceae	N	N	N	N	N	Y																												*			
Ailanthus altissima	alpine bentgrass ~~tree of heaven~~	Poaceae Simaroubaceae	Y N	N			N N	Y																								X*						
Aira caryophyllea	silver hairgrass	Poaceae	N				N		X						X																			X				
Allium campanulatum	~~dusky onion~~	~~Liliaceae~~					N		X	X		X	X	X	X	X			X			X				X		X						X		X	X	X		X	X
Allium parvum	small onion	Liliaceae	Y				N					X																											
Allium sanbornii var. *sanbornii*	~~Sanborn's onion~~	~~Liliaceae~~					N				X																											
Allium sp.	onion	Liliaceae	Y				N					X																											
															X																								

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Attachment 2. Comprehensive Species List

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							Pit 6 Transmission Line	Pit 7 Transmission Line	12KV Transmission Line Oak Mountain Road	Targeted Weed? JB Black Transmission Line	Pit 6 Road	Voucher? (site of collection Station)?	Special Status Native? Pit 7 Road	Reveg?	Lines	Roads	a		Pit 7 Afterbay Road and Associated Areas	Iron Canyon Reservoir Road and Associated	Iron Canyon Spillway to Kosk Creek Road	Tunnels		James B. Black Powerhouse	McCloud Tunnel at Hawkins Creek	Iron Canyon Tunnel at Willow Creek Siphon	Pit 7 Powerhouse James B. Black Penstock	Gages								Project Facilities		Reser-voirs		Dispersed Recreation Sites									Iron Canyon Reservoir Recreation Sites				
Corylus cornuta	beaked hazelnut California hazelnut	Betulaceae	Y	N	N	N	N																																	X					
Corylus cornuta var. *californica*	Suksdorf's hawthorn smooth hawksbeard	Betulaceae Rosaceae	Y Y	N N	N N	N N	N N		X			X	X	X	X		X	X	X	X		X	X							X	X	X		X	X	X	X		X		X	X		
Crataegus suksdorfii	Milo Baker's cryptantha	Asteraceae	N	N	N	N	N																																	X	X				
Crepis capillaris	cryptantha	Boraginaceae	Y	N	N	Y	N																																	X					
Cryptantha milobakeri	Torrey's cryptantha	Boraginaceae	Y	N	N	N	N																																	X					
Cryptantha sp.	Bermudagrass	Boraginaceae	Y	N	N	Y	N													X	X																		X					
Cryptantha torreyana	Pacific hound's tongue	Poaceae	N	N	Y	N	N																																	X					
Cynodon dactylon	western hound's tongue	Boraginaceae	Y	N	N	N	N																																	X					
Cynoglossum grande	gypsyflower	Boraginaceae Boraginaceae	Y N	N Y	Y N	N N	N N				X	X	X		X			X	X																				X		X	X		
Cynoglossum occidentale	bristly dogstail grass	Poaceae	N	N	N	N	N																																	X					
Cynosurus echinatus	tall flatsedge	Cyperaceae	Y			N					X		X								X																		X	X				
Cyperus eragrostis	brittle bladderfern	Dryopteridaceae	Y			N			X	X	X	X	X	X	X	X	X	X	X		X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Cystopteris fragilis	Scotch broom orchardgrass	Fabaceae Poaceae	N N			N N					X	X	X	X																														X
Cytisus scoparius	Indian rhubarb	Saxifragaceae	Y			N	Y	X			X	X		X			X	X	X	X																		X		X	X				
Dactylis glomerata	Durango root	Datiscaceae	Y			N				X	X																												X					
Darmera peltata									X		X	X	X	X	X	X	X	X	X	X	X	X	X	X															X	X				X
Datisca glomerata													X	X	X	X																												

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								Pit 6 Transmission Line	Pit 7 Transmission Line 12KV Transmission Line Oak Mountain Road	JB Black Transmission Line Pit 6 Road	Voucher? (site of collection or sighting)	Special Status?	Pit 7 Road	Reveg?	a	Pit 7 Afterbay Road and Associated Areas	Iron Canyon Reservoir Road and Associated Areas	Iron Canyon Spillway to Kosk Creek Road	James B. Black Powerhouse	McCloud Tunnel at Hawkins Creek	Iron Canyon Tunnel at Willow Creek Siphon	Pit 7 Powerhouse James B. Black Penstock																											
Daucus carota	Queen Anne's lace	Apiaceae	N	N	N	N	N					X																								X	X	X			
Delphinium nudicaule	red larkspur	Ranunculaceae	Y	N	N	N	N	Y				X	X	X	X	X		X					X		X	X								*					X			X
Delphinium nuttallianum	twolobe larkspur	Ranunculaceae	Y	N	N	N	N																														X		X		
Delphinium patens	zigzag larkspur	Ranunculaceae	Y	N	N	N	N																														X				
Delphinium patens ssp. *patens* *Delphinium* sp.	zigzag larkspur	Ranunculaceae	Y	N	N	N	N																		X																X
Deschampsia danthonioides	larkspur	Ranunculaceae	Y	N	N	N	N		X			X					X			X	X			X												X				
Deschampsia elongata	annual hairgrass	Poaceae	Y				N	Y					X					X																		*				
Dianthus armeria ssp. *armeria*	slender hairgrass	Poaceae	Y				N	Y					X					X													X	X			X	X	*	*		X		
Dianthus deltoides ssp. *deltoides*	Deptford pink meadow pink	Caryophyllaceae	N N	N	N	N	N	Y	X	*	X	X	X	X	X	X	X	X																		X		X	X		
Dicentra formosa	Pacific bleeding heart	Fumariaceae	Y	N	N	N	N		X	X	X	X	X	X	X	X	X	X	X	X		X	X							X	X		X	X	X	X	X	X	X	X	X
Dichelostemma capitatum ssp. *capitatum*	bluedicks	Liliaceae	Y	N	N	N	N				X	X	X	X	X	X		X			X			X	X									X				X	X		
Dichelostemma congestum		Liliaceae	Y	N	Y	N	N																																		
Dipsacus fullonum	ookow	Dipsacaceae	N				N																													X				
Disporum hookeri	roundtooth snakelily	Liliaceae	Y				N																													X				
	Fuller's teasel								X			X						X				X														X	X		X		
	drops of gold																																								

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								Pit 6 Transmission Line	Pit 7 Transmission Line	12KV Transmission Line	Oak Mountain Road	JB Black Transmission Line	Pit 6 Road	Pit 7 Road	Roads						Tunnels			Ganges			Project Facilities																Reser-voirs		Dispersed Recreation Sites								Iron Canyon Reservoir Recreation Sites				
															a																																				
Galium aparine	stickywilly	Rubiaceae	Y	N	N	N	N		X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Galium argense	~~Argus bedstraw~~	~~Rubiaceae~~	Y	N	N	N	N																																			X							
Galium bolanderi	Bolander's	Rubiaceae	Y	N	N	N	N			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Galium divaricatum	bedstraw	Rubiaceae		N	N	N	N					X																																						
Galium sp.	Lamarck's bedstraw	Rubiaceae		N	N	N	N					X																																							
Galium trifidum var. *pacificum*	bedstraw	Rubiaceae	Y	N	N	N	N											X																																
Galium triflorum	threepetal bedstraw	Rubiaceae	Y			N	N					X				X	X			X																													
Garrya fremontii	fragrant bedstraw	~~Garryaceae~~	Y	N	N	N	N		X								X			X																													
Gayophytum diffusum ssp. *parviflorum*	bearbrush	Onagraceae	Y	N	Y	N	N													X																													
Gayophytum heterozygum	spreading		Y	N	N	N																																											
Gayophytum sp.	groundsmoke	Onagraceae	Y	N	N	N	N																																										
Geranium dissectum	zigzag	Onagraceae	N	N	N	N	N					X		X				X																															
Geranium sp.	groundsmoke	Geraniaceae		N	N	N	N					X																																					
Geum macrophyllum	groundsmoke	Geraniaceae		N	N		N																																									
Gilia capitata	cutleaf geranium	Rosaceae	Y	N	N		N	Y																																								
Gilia capitata ssp. capitata	geranium	Polemoniaceae	Y				N																																									
Gilia sp.	largeleaf avens	Polemoniaceae	Y				N			X			X	X	X			X	X		X				X				X			X	X				X	X							
Glyceria elata	bluehead gilia	Polemoniaceae	Y				N					X																																				
Gnaphalium canescens	bluehead gilia	Poaceae	Y				N																																									
Gnaphalium canescens ssp. *beneolens*	gilia	Asteraceae	Y				N							X				X																														
	fowl mannagrass cudweed	Asteraceae	Y				N					X																																				

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								Pit 6 Transmission Line	Pit 7 Transmission Line	12KV Transmission Line Oak Mountain Road	Targeted Weed?	JB Black Transmission Line	Pit 6 Road	Voucher? (site of collection Station)?	Special Status?	Pit 7 Road	Reveg?	Lines	a	Roads	Pit 7 Afterbay Road and Associated Areas	Iron Canyon Reservoir Road and Associated	Iron Canyon Spillway to Kosk Creek Road	Tunnels	James B. Black Powerhouse	McCloud Tunnel at Hawkins Creek	Iron Canyon Tunnel at Willow Creek Siphon	Gages	Pit 7 Powerhouse James B. Black Penstock								Reser-voirs		Dispersed Recreation Sites								Iron Canyon Reservoir Recreation Sites				
Orthocarpus sp. [not *O. pachystachyus*]	owl's-clover	Scrophulariaceae	Y	N	N	N	N									X				X																					X
Osmorhiza chilensis	osmorhiza	Apiaceae	Y	N	N	N	N		X			X	X	X	X	X	X	X	X	X	X	X	X	X	X						X	X	X	X	X	X	X	X		X	X	X	X	X
Oxalis corniculata	creeping woodsorrel	Oxalidaceae	Y	N	N	N	N																																		X			
Panicum capillare	witchgrass	Poaceae	Y	N	N	N	N					X	X		X																X	X			X				X		X		X		
Panicum dichotomiflorum	fall panicgrass	Poaceae	Y	N	N	N	N																													X									
Paxistima myrsinites	Oregon boxleaf	Celastraceae	Y	N			N		X			X									X	X					X	X								X	X		X	X	X	X		X	X	X		
Pedicularis densiflora	Indian warrior	Scrophulariaceae	Y				N					X	X	X			X		X			X														X							X	X	
Pellaea mucronata var. *mucronata*	birdfoot cliffbrake	Pteridaceae	Y				N	Y					X	X	X				X*																	X								X		
Penstemon azureus var. *azureus*	azure penstemon	Scrophulariaceae	Y	N	N		N	Y			X											X													X								X*	X		
Penstemon heterodoxus var. *shastensis*	Shasta beardtongue	Scrophulariaceae	Y	N	N	N	N														X																								
Penstemon laetus	mountain blue penstemon	Scrophulariaceae	Y	N	N	N	N							X																															
Penstemon laetus var. *leptosepalus*	mountain blue penstemon	Scrophulariaceae	Y	N	N	N	N					X			X																														
Penstemon laetus var. *sagittatus*	mountain blue penstemon	Scrophulariaceae	Y				N																																			X			
Penstemon roezlii	Roezl's penstemon	Scrophulariaceae	Y				N	Y																																		X*			
Penstemon sp. [not *P. filiformis*]	beardtongue																																	X										

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Heterocladium procurrens	heterocladium moss	Pterigynandraceae		N	N	N	N																																X		
Homalothecium nuttallii	Nuttall's homalothecium moss	Brachytheciaceae		N			N												X																			X	X		X
Homalothecium pinnatifidum	pinnatifid homalothecium moss	Brachytheciaceae	Y	N	N	N	N																														X					X
Homalothecium sp.	homalothecium moss	Brachytheciaceae		N	N	N	N					X														X														X			
Hygroamblystegium tenax	hygroamblystegium moss	Amblystegiaceae	Y	N	N	N	N																														X					
Hypnum subimponens	hypnum moss isothecium moss	Hypnaceae		N	N	N	N																																	X			
Isothecium cristatum	isothecium moss Oregon	Brachytheciaceae		N	N	N	N					X			X																					X	X					
Isothecium myosuroides	eurhynchium moss leucolepis umbrella	Brachytheciaceae	Y	N	N	N	N																																	X			X
Kindbergia oregana	moss marchantia liverwort	Brachytheciaceae		N	N	N	N																																	X			
Leucolepis acanthoneuron	Lyell's orthotrichum moss orthotrichum	Mniaceae		N	N	N	N																																	X			
Marchantia sp.	moss	Marchantiaceae		N	N		N									X																											
Orthotrichum lyellii	philonotis moss	Orthotrichaceae	Y				N										X			X																X	X		X			X
Orthotrichum sp.	low philonotis moss	Orthotrichaceae					N					X	X							X																			X			
Philonotis fontana		Bartramiaceae					N																																		X			
Philonotis fontana var. *caespitosa*		Bartramiaceae	Y				N																																		X			

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Aportion ofthis proposed infrastructureareaoverlapped with 2007 survey areas; these overlap areas were not resurveyed in 2008. Therefore, data reported for this proposed infrastructure area presents the comprehensive species list from the relevant 2007 survey area inthe columntothe right.

[c] This occurrence requires follow-up verification. See the relevant species occurrence section in TM-12 (*i.e.*, Section 4.1.3, 4.1.4, or 4.1.6) for details.

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