



Appendix C – Upper Drum-Spaulding  
& Lower Drum Biological Resources  
Information

PG&E's Upper Drum-Spaulding  
Hydroelectric Project (FERC No. 2310)  
and Lower Drum Hydroelectric Project  
(FERC No. 14531)

*Nevada and Placer Counties, California*

February 2021

Prepared for:

State Water Resources Control Board

Prepared by:

HDR





*This page is intentionally blank*



# 1. Biological Resources Technical Memorandum

## 1.1 Methodology

The following data reviews, relicensing studies, and analyses were performed and/or reviewed to characterize the environmental setting of the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project (collectively referred to as Proposed Projects) areas, and to determine what potential effects activities associated with the Proposed Projects could have on biological resources.

## 1.2 Literature Review

The following sources were used to characterize the environmental setting across the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas. Documentation for the Proposed Projects was reviewed for site-specific data regarding habitat suitability for special-status species. Preliminary database searches were also performed to identify special-status species and their habitats, as well as aquatic resources, with the potential to occur in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas, using the following databases:

- U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation System (2020a)
- USFWS Critical Habitat Portal (2020b)
- California Department of Fish and Wildlife (CDFW) California Natural Diversity Database QuickView Tool in BIOS 5 (2020a)
- California Native Plant Society (CNPS) Inventory of Rare, Threatened, and Endangered Plants of California (2020)
- National Marine Fisheries Service (NMFS) California Species List Tool (2020)
- Region 5 Regional Forester's Sensitive Animal Species List for the Tahoe National Forest (U.S. Forest Service [USFS] 2013a)
- Region 5 Regional Forester's Sensitive Plant Species List for the Tahoe National Forest (2013b)
- Google Earth aerial imagery (2020)
- U.S. Geological Survey (USGS) topographic maps

The USFWS databases were queried to identify federally listed species and critical habitats that have the potential to be affected by the Proposed Projects. A query of the

California Natural Diversity Database provided a list of processed and unprocessed special-status species occurrences in the Auburn, Chicago Park, Colfax, Gold Hill, Lake Combie, and Pilot Hill, California, USGS 7.5-minute quadrangles (quads), which overlap with the Proposed Lower Drum Project area. The following USGS quads overlap with and were queried for the Proposed Upper Drum-Spaulding Project: Blue Canyon, Cisco Grove, Dutch Flat, English Mountain, Graniteville, Soda Springs, Washington, Webber Peak, and Westville. In addition, all quads adjacent to the aforementioned quads were included in the query. The CNPS database was queried to identify special-status plant species with the potential to occur in the aforementioned USGS quads. The NMFS database was also queried in the USGS quads that overlap with the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas to identify species, essential fish habitat, and/or critical habitat under its jurisdiction with the potential to occur. Lastly, the Forest Service Sensitive Species Lists were reviewed to identify any plant and wildlife species that are recognized by the Forest Service as sensitive (FSS).

### 1.3 Relicensing Studies

As part of the relicensing process, 11 terrestrial resources studies, 3 threatened and endangered species studies, and 16 aquatic resources studies were conducted between 2009 and 2011. The final technical memoranda for the completed studies have been posted to the relicensing website<sup>1</sup> and are filed with the Final License Application (FLA) in Appendix E12. These studies are summarized in Table C-1.

**Table C-1.** Summary of Relicensing Studies

Study Number	Study Name	Tech Memo Number	Year Completed
<b><i>Terrestrial Resources Studies</i></b>			
2.3.9	Special-Status Aquatic Reptiles – Western Pond Turtle	3-9	2010
2.3.14	Western Pond Turtle Basking	3-14	2010
2.4.1	Special-Status Wildlife Movement – CWHR	4-1	2010
2.4.2	Wildlife: Movement	4-2	2010
2.4.2	Wildlife: Bats	4-3	2010
2.5.1	Special-Status Plants	5-1	2010
2.6.1	Riparian Habitat	6-1	2010
2.6.2	Wetlands	6-2	2010
2.7.4	CESA-Listed and Protected Wildlife – CWHR	7-4	2010

<sup>1</sup> Pacific Gas and Electric (PG&E). 2020. Drum-Spaulding Public Relicensing Website. Accessed November 12, 2020. <http://www.eurekasw.com/DS/default.aspx>.





**Table C-1.** Summary of Relicensing Studies

Study Number	Study Name	Tech Memo Number	Year Completed
2.7.5	CESA-Listed Wildlife - Bald Eagle	7-5	2010
2.7.6	CESA-Listed Plants	7-6	2009
<b><i>Threatened and Endangered Species Studies</i></b>			
2.7.1	ESA-Listed Amphibians – California Red-Legged Frog	7-1	2010
2.7.2	ESA-Listed Wildlife – Valley Elderberry Longhorn Beetle	7-2	2010
2.7.3	ESA-Listed Plants	7-3	2010
<b><i>Aquatic Resources Studies</i></b>			
2.3.1	Stream Fish Populations	3-1	2010
2.3.2	Instream Flow	3-2	2010
2.3.4	Fish Passage	3-4	2010
2.3.5	Fish Entrainment	3-5	2011
2.3.6	Special-Status Amphibians – FYLF Surveys	3-6	2010
2.3.7	Special-Status Amphibians – FYLF Habitat Modeling	3-7	2010
2.3.8	Special-Status Amphibians – SNYLF Surveys	3-8	2010
2.3.9	Special-Status Reptiles – WPT	3-9	2010
2.3.10	Aquatic Macroinvertebrates	3-10	2010
2.3.11	Special-Status Mollusks	3-11	2010
2.3.12	Reservoir Fish Populations	3-12	2010
2.3.13	Western Placer County Streams	3-13	2010
2.3.14	Western Pond Turtle Basking	3-14	2010
2.3.15	2010 Dutch Flat No 2. Entrainment Netting	3-15	2010
2.3.16	Fish Barriers	3-16	2011
2.3.17	2011 Dutch Flat No 2. Entrainment Netting	3-17	2011

Notes: CWHR = California Wildlife Habitat Relationships, CESA = California Endangered Species Act, ESA = Endangered Species Act, FYLF = foothill yellow-legged frog, SNYLF = Sierra Nevada yellow-legged frog, WPT = western pond turtle

The results of these studies, along with other information surrounding biological resources in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas, are synthesized in the Final Environmental Impact Statement (FEIS) (Federal Energy Regulatory Commission [FERC] 2014) and FLA (Pacific Gas and Electric [PG&E] 2011). These documents were reviewed to help inform the biological setting.

## 1.4 Impact Analysis

The impact analysis was based on the descriptions of the Proposed Projects; the environmental setting; and on federal, state, and local regulatory requirements regarding effects on biological resources. In addition, the impact analysis used data collected from the literature review and previous relicensing studies. When information about the presence of a particular special-status species was unknown, but suitable habitat was present, the impact analysis took a conservative approach by inferring the presence of special-status species in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas until additional surveys determine otherwise. Impacts on specific biological resources are identified and appropriate avoidance, minimization, compensation, mitigation measures, and/or relevant conditions and/or implementation plans associated with the Proposed Projects are discussed further below.

## 2. Vegetation Communities and Habitats

Vegetation communities are assemblages of plant species that occur in the same area and are defined by species composition and relative abundance. Given the large size of the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas, the descriptions of vegetation communities have been simplified such that they are described in terms of elevation ranges and include the dominant and common associate plant species found in each. These elevation ranges somewhat overlap and integrate with each other, forming transition zones on their outer edges.

The locations of features included in the Upper Drum-Spaulding Hydroelectric Project range in elevation from 7,820 feet (ft) at White Rock Reservoir (above Fordyce Lake) to 2,755 ft at Dutch Flat No.1 powerhouse. Lower Drum Hydroelectric Project facilities range in elevation from 1,960 ft at the Bear River Canal Diversion Dam to 435 ft at Newcastle powerhouse.

A mix of conifer, hardwood, chaparral, riparian, and serpentinite communities can be found at elevations below 5,000 feet. Dominant vegetation in the conifer communities includes incense cedar (*Calocedrus decurrens*), Douglas-fir (*Pseudotsuga menziesii*), white fir (*Abies concolor*), madrone (*Arbutus menziesii*), and sugar pine (*Pinus lambertiana*). Additionally, stands of Brewer's oak (*Quercus garryana* var. *breweri*) occupy south-facing slopes and areas of annual grasslands. Chaparral species include whiteleaf manzanita (*Arctostaphylos viscida*), greenleaf manzanita (*Arctostaphylos patula*), mountain whitethorn (*Ceanothus cordulatus*), wedgeleaf ceanothus (*Ceanothus cuneatus*), deerbrush (*Ceanothus integerrimus*), and poison oak (*Toxicodendron diversilobum*). Riparian areas are dominated by white alder (*Alnus rhombifolia*), maples (*Acer* spp.), and willows (*Salix* spp.). In addition, several outcrops of habitat



characterized by serpentine soil are present in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas. Dominant plants in these areas are leather oak (*Quercus durata*), gray pine (*Pinus sabiniana*), and wedgeleaf ceanothus. Additional serpentine indicator species include milkwort jewelflower (*Streptanthus polygaloides*) and yellow pincushion (*Chaenactis glabriuscula*) (FERC 2014).

At elevations above 5,000 feet, forested areas are dominated by an incense cedar, red fir (*Abies magnifica*), white fir, and Jeffrey pine (*Pinus jeffreyi*) overstory. Lodgepole pines (*Pinus contorta* var. *murrayana*) exist in moist soils in meadows and along shorelines. Black oak (*Quercus kelloggii*), willow, quaking aspen (*Populus tremuloides*), and mountain alder (*Alnus incana*) are common deciduous trees and may form a subcanopy beneath the conifer overstory. Some areas are barren, devoid of vegetation because of the rocky and steep terrain with little to no soil layer. The shrub layer is dominated by mountain whitethorn, huckleberry oak (*Quercus vacciniifolia*), pinemat manzanita (*Arctostaphylos nevadensis*), and bush chinquapin (*Chrysolepis sempervirens*) (FERC 2014).

Vegetation community mapping from the Forest Service Classification and Assessment with Landsat of Visible Ecological Groupings data were cross-referenced with CDFW's California Wildlife Habitat Relationship (CWHR) classification system to create habitat maps for the Proposed Upper Drum-Spaulding Project area and Proposed Lower Drum Project area, respectively. Each CWHR habitat type in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas is listed in Table C-2 and their locations are shown in the maps attached to this appendix. General descriptions of each habitat type, including physical conditions and dominant species, can be found on the Wildlife Habitats – California Wildlife Habitat Relationships System website (CDFW 2020b). It should be noted that the location and extent of these habitats have not been ground-truthed.

**Table C-2.** CWHR Habitats

Habitat	Upper Drum-Spaulding	Lower Drum
Annual Grassland (AGS)	X	X
Aspen (ASP)	X	
Barren (BAR)	X	
Blue Oak-Foothill Pine (BOP)		X
Blue Oak Woodland (BOW)		X
Cropland (CRP)		X
Douglas Fir (DFR)		X
Jeffrey Pine (JPN)	X	
Lacustrine (LAC)	X	X
Mixed Chaparral (MCH)	X	X

**Table C-2.** CWHR Habitats

Habitat	Upper Drum-Spaulding	Lower Drum
Montane Hardwood (MHW)	X	X
Montane Hardwood-Conifer (MHC)	X	X
Montane Riparian (MRI)	X	X
Perennial Grassland (PGS)	X	
Ponderosa Pine (PPN)	X	X
Red Fir (RFR)	X	
Riverine (RIV)	X	
Sierran Mixed Conifer (SMC)	X	X
Urban (URB)	X	X
Valley Oak Woodland (VOW)		X
Wet Meadow (WTM)	X	
White Fir (WFR)	X	

### 3. Special-status Natural Communities and Aquatic Resources

Sensitive communities and aquatic resources included are those that are protected under CDFW, Sections 1600–1603 of the California Fish and Game Code (FGC), and/or Sections 401 and Section 404 of the Clean Water Act. Sensitive habitats typically either contain special-status species, their associated habitat, or are sufficiently rare themselves to warrant protection as ranked by the NatureServe Heritage Program Status Rank (Faber-Langendoen et al. 2012).

Aquatic resources provide a variety of habitat functions for plants and wildlife including foraging, cover, migration, and movement corridors for both special-status and common species. In addition to habitat functions, these features provide physical conveyance of surface water flows capable of handling large storm events. Large storms can produce extreme flows that cause bank cutting and sedimentation of open waters and streams. Aquatic resources can slow these flows and lessen the effects of large storm events, protecting habitat and other resources.

In the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas, aquatic resources and their associated riparian corridors would be considered sensitive communities due to their unique hydrophytic vegetation and ability to support special-status species. These areas include, but are not limited to, reservoirs, streams, riparian areas, and wetlands.



The Tahoe National Forest considers stands of quaking aspen a community of concern and specifically asked that this species be surveyed as part of the relicensing studies. Quaking aspens and their associated riparian habitats are the most species-rich avian habitats in the Sierra Nevada, making them disproportionately more important than other habitats in the Proposed Upper Drum-Spaulding Project and Proposed lower Drum Project areas to birds and other wildlife (USFS 2018). Thirty-eight occurrences of quaking aspen were found in the Proposed Upper Drum-Spaulding Project area during relicensing studies (none in the Proposed Lower Drum Project area). In addition, oak woodland is considered sensitive due to Placer County policies surrounding preservation of this community (FERC 2014).

The high-level CWHR habitat mapping described in Section 2, *Vegetation Communities and Habitats*, is not meant to capture the exact extent and location of communities, nor does it classify areas at a refined vegetation alliance level. For these reasons, it is likely that additional sensitive communities occur other than those mentioned here, such as those defined as sensitive by the NatureServe Heritage Program.

## 4. Fisheries Habitat and Essential Fish Habitat

### 4.1 Upper Drum-Spaulding Fish Habitat

Fisheries habitat present in the Proposed Upper Drum-Spaulding Project area includes 24 reservoirs, forebays, and afterbays; 1 diversion dam; 3 canals; and 27 stream reaches. For more information on each of these waterbodies, refer to the FEIS (FERC 2014) and the FLA (PG&E 2011). Streams and reservoirs across both of the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas support rainbow trout (*Oncorhynchus mykiss*), brown trout (*Salmo trutta*), and a transitional warm water fish assemblage in lower-elevation areas. Prior to the introduction of nonnative fish species, the Sierra Nevada native fish populations in accessible lakes and streams of the Sacramento-San Joaquin drainage included 22 taxa, including three anadromous fish: Chinook salmon (*Oncorhynchus tshawytscha*), steelhead (*Oncorhynchus mykiss*, anadromous form), and Pacific lamprey (*Entosphenus tridentatus*; NID 2008).

The abundance and distribution of native fish species in Sierra Nevada streams, rivers, and lakes has dramatically changed as a result of several factors, including the introduction of nonnative species, construction of dams and diversions, alteration of aquatic habitat, and watershed disturbance (Moyle et al. 1997). Prior to construction of the Englebright Dam for control of mining debris in 1941, the Yuba River supported anadromous populations of spring-run Chinook salmon, fall-run Chinook salmon, and steelhead. Currently operated by the U.S. Army Corps of Engineers (USACE), Englebright Dam defines the upstream limit of salmon and steelhead migration, and

none of these species are present in the existing Proposed Upper Drum-Spaulding Project area or any affected reaches (NMFS 2014).

Rainbow trout support recreational fisheries in the Proposed Upper Drum-Spaulding Project area. Rainbow trout is native to most west-side Sierra Nevada watersheds below an elevation of 4,900 feet above mean sea level but has been introduced to higher-elevation waters including much of the Proposed Upper Drum-Spaulding Project area. Many of the larger lakes/reservoirs are managed for and receive heavy recreational fishing pressure; annual stocking is a key component of CDFW's recreational fishery management program. Although natural reproduction occurs in some waters associated with the Proposed Projects, stocking is necessary to sustain populations of game fish in waters with high angler usage. PG&E has proposed and agreed to fund the stocking of Lake Spaulding for recreational use.

## 4.2 Lower Drum Fish Habitat

Fisheries habitat present in the Proposed Lower Drum Project area includes five dams and reservoirs, forebays and afterbays, two diversion dams, four canals, and four stream reaches. The reservoirs associated with the Proposed Lower Drum Project include the Bear River Canal Diversion dam on the Bear River, the Halsey Forebay (off-channel), the Halsey Afterbay on Dry Creek, the Rock Creek Reservoir on Rock Creek, and the Wise Forebay (off-channel). Proposed Lower Drum Project facilities affect flows in Dry Creek below Halsey afterbay, Rock Creek below Rock Creek reservoir, Auburn Ravine<sup>2</sup> below South Canal, and Mormon Ravine below Newcastle powerhouse. See Figure C-1 for a map of the extent of anadromy in Auburn Ravine.

## 4.3 Essential Fish Habitat in Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project Areas

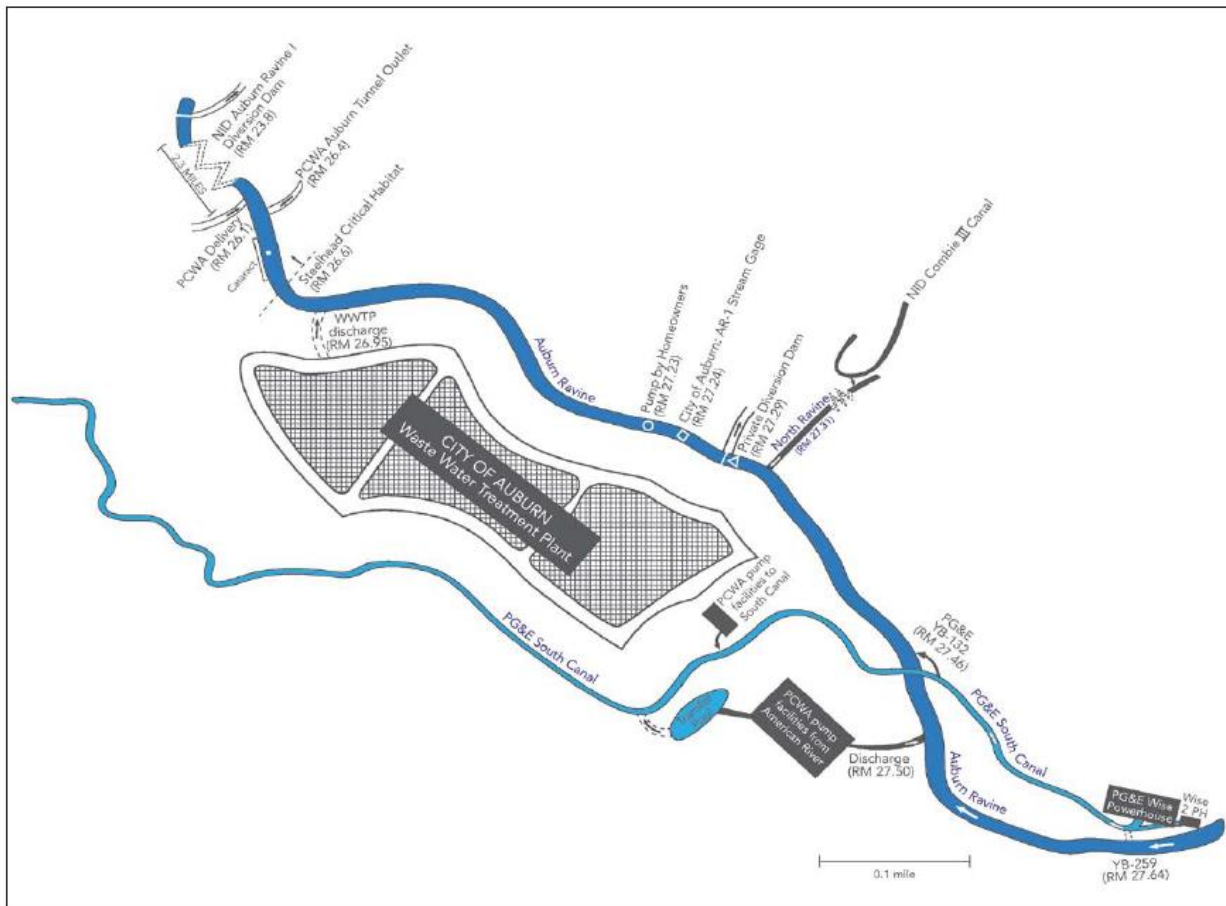
The Magnuson-Stevens Act requires federal agencies to consult with NMFS on all actions that may adversely affect essential fish habitat (EFH). EFH has been designated for Pacific salmon in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas (50 Code of Federal Regulations [CFR] 660.4391 and 660.392). The designation does not identify specific salmon species or races (for example, spring-run or fall-run); however, Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, and Central Valley fall- and late-fall-run Chinook salmon are species that occur in the Central Valley and are managed under the *Pacific Coast Salmon Fisheries Management Plan*. The Vanjop Diversion

---

<sup>2</sup> The upper extent of anadromy in Auburn Ravine is at RM 26.6, which is proximally downstream of the South Canal input.



Dam on the Bear River and the Bureau of Recreation's Folsom Project at Nimbus Dam prevents passage of anadromous fishes into the Proposed Lower Drum Project area through the Bear and American Rivers. Passage of anadromous fish within the Sacramento River Basin to Auburn Ravine is possible. USACE's Englebright Dam prevents passage of anadromous fishes into the Proposed Upper Drum-Spaulding Project area, including Chinook salmon; therefore, no species that are covered by EFH designations can naturally occur in the Proposed Upper Drum-Spaulding Project area (NMFS 2014).



**Figure C-1.** Extent of Anadromy in Auburn Ravine

## 5. Critical Habitat

Critical habitat is designated by USFWS or NMFS and is defined as specific geographic areas that are characterized by features essential to the conservation of a federally threatened or endangered species and that may require special management and protection. Critical habitat may also include areas that are not currently occupied by the species but will be needed for its recovery.

Appendix C Biological Resources Information  
PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
and Lower Drum Hydroelectric Project (FERC No. 14531)

Designated critical habitat for Sierra Nevada yellow-legged frog encompasses portions of the Proposed Upper Drum-Spaulding Project area (50 CFR Part 17). The following Proposed Upper Drum-Spaulding Project reservoirs are included in designated critical habitat subunit 2C (Black Buttes): Upper Rock Lake, Lower Rock Lake, and Lake Spaulding. No designated critical habitat for other listed fish or wildlife occurs in the Proposed Upper Drum-Spaulding Project area. USFWS considers that subunit 2C contains the physical or biological features essential to the conservation of the species, is currently functional habitat sustaining frogs, and is needed to protect core surviving populations and their unique genetic heritage. Within these areas, the primary constituent elements of the physical or biological features essential to the conservation of the Sierra Nevada yellow-legged frog consist of:

- Aquatic habitat for breeding and rearing--habitat that consists of permanent water bodies, or those that are either hydrologically connected with, or close to, permanent water bodies, including, but not limited to, lakes, streams, rivers, tarns, perennial creeks (or permanent plunge pools within intermittent creeks), pools (such as a body of impounded water contained above a natural dam), and other forms of aquatic habitat;
- Aquatic nonbreeding habitat (including overwintering habitat)--this habitat may contain the same characteristics as aquatic breeding and rearing habitat (often at the same locale), and may include lakes, ponds, tarns, streams, rivers, creeks, plunge pools within intermittent creeks, seeps, and springs that may not hold water long enough for the species to complete its aquatic life cycle. This habitat provides for shelter, foraging, predator avoidance, and aquatic dispersal of juvenile and adult mountain yellow-legged frogs; and
- Upland areas adjacent to or surrounding breeding and nonbreeding aquatic habitat that provide area for feeding and movement by frogs.

In NMFS's five-year review<sup>3</sup> of Central Valley steelhead, it concluded that the threatened Central Valley steelhead distinct population segment (DPS) included all naturally spawned populations of steelhead below natural and human-made barriers in the Sacramento and San Joaquin Rivers and tributaries. Auburn Ravine river mile 0.0 to 26.6 is classified as critical habitat for Central Valley steelhead. This is the only designated critical habitat in the Proposed Lower Drum Project area. Critical habitat for Central Valley steelhead contains physical habitat essential to the conservations of a species (PCEs). Within Auburn Ravine, biological features that are considered vital for

---

<sup>3</sup> National Marine Fisheries Service (NMFS). 2016. *5-Year Status Review California Central Valley Recovery Domain, California Central Valley Steelhead DPS*. National Marine Fisheries Service West Coast Region.



Central Valley steelhead include habitat for adult and juvenile migration, spawning incubation, and juvenile rearing.

## 6. Fish and Wildlife Movement Corridors

Wildlife corridors refer to established migration routes commonly used by resident and migratory species for passage from one geographic location to another. Corridors are present in a variety of habitats and link otherwise fragmented acres of undisturbed area. Maintaining the continuity of established wildlife corridors is important to (1) sustain species with specific foraging requirements, (2) preserve a species' distribution potential, and (3) retain diversity among many wildlife populations. Therefore, resource agencies consider wildlife corridors to be a sensitive resource.

Most of the watershed basins associated with the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas have non-project-related, downstream dams that block the migration of anadromous fishes, although the dams associated with the Proposed Projects act as existing aquatic migration barriers to current fish populations. Canals and other facilities associated with the Proposed Projects may act as barriers to local and regional wildlife movement; however, wildlife crossings are present, and several conditions are included in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project to increase permeability.

Anadromous fish have access to Auburn Ravine, a tributary of the Sacramento River. Auburn Ravine also provides critical habitat for Central Valley steelhead. Within the geographic scope of the Proposed Projects, critical habitat includes Auburn Ravine from river mile 0 to 26.6.

## 7. Special-status Species

Candidate, sensitive, or special-status species are commonly characterized as species that are at potential risk or actual risk to their persistence in a given area, or across their native habitat. These species have been identified and assigned a status ranking by governmental agencies such as CDFW, USFWS, NMFS, or private organizations such as CNPS. The degree to which a species is at risk of extinction is the determining factor in the assignment of a status ranking. Some common threats to a species' or population's persistence include habitat loss, degradation, and fragmentation, as well as human conflict and intrusion. For the purposes of this biological review, special-status species are defined as follows:

- listed, proposed, or candidates for listing under the federal Endangered Species Act (50 CFR 17.11 – listed; 61 *Federal Register* 7591, February 28, 1996,)

Appendix C Biological Resources Information  
PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
and Lower Drum Hydroelectric Project (FERC No. 14531)

- listed or proposed for listing under the California Endangered Species Act (CESA; FGC 1992 Section 2050 et seq.; 14 California Code of Regulations Section 670.1 et seq.)
- designated as a species of special concern by CDFW
- designated as fully protected by CDFW (FGC Sections 3511, 4700, 5050, 5515)
- species that meet the definition of rare or endangered under CEQA (14 California Code of Regulations Section 15380), including CNPS List Rank 1b and 2
- species designated as sensitive by the Forest Service for the Tahoe National Forest under the Forest Service Manual 2672.11, 2670.44–2670.5

The results of the USFWS, NMFS, CDFW, CNPS, and the Forest Service queries identified several special-status species with the potential be affected by activities. Tables in this appendix provide descriptions of the habitat requirements for each species and conclusions regarding the potential for each species to be affected by the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project. In cases where a determination was made that no suitable habitat for a given species was present, that species is not analyzed further in this document.

Results of the relicensing studies were reviewed to help inform the potential for special-status species to occur in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas; however, the majority of these studies are over a decade old, making some of the findings and conclusions regarding the presence or absence of species outdated. Tables C-3 through C-6 summarize those species determined to have the potential to be affected by activities, and their associated CWHR habitat types as interpreted from the more detailed habitat requirements in the special-status species tables in this appendix.

The CWHR habitats listed in the tables are meant as a high-level reference to where these species could occur in the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas. The locations and extent of these habitats have not been ground-truthed and species could potentially use habitats other than those identified in Tables C-3 through C-6.



**Table C-3.** Special-status Species: Proposed Lower Drum Project Plants

Scientific Name	Common Name	Federal Status	State Status	CRPR <sup>4</sup>	Habitat Characteristics <sup>5</sup>	Impacts Analyzed?	Rationale
<i>Allium jepsonii</i>	Jepson's onion	None	None	1B.2	Serpentine or volcanic soils in chaparral, cismontane woodland, and lower montane coniferous forest. Elevation: 980–4,330 feet. Blooming period: April–August	Yes	Suitable habitat present.
<i>Balsamorhiza macrolepis</i>	big-scale balsamroot	None	None	1B.2	Occasionally in serpentine soils in chaparral, cismontane woodland, and grassland. Elevation: 295–5,100 feet. Blooming period: March–June	Yes	Suitable habitat present.
<i>Calystegia stebbinsii</i>	Stebbins' morning-glory	FE	SE	1B.1	Serpentine or gabbro soils in openings of chaparral and cismontane woodland. Elevation: 605–3,575 feet. Blooming period: April–July	Yes	Suitable habitat present.
<i>Calystegia vanzuukiae</i>	Van Zuuk's morning-glory	None	None	1B.3	Serpentine or gabbro soils in chaparral and cismontane woodland. Elevation: 1,640–3,870 feet. Blooming period: May–August	Yes	Suitable habitat present.

<sup>4</sup> California Rare Plant Rank

<sup>5</sup> All plant habitat descriptions derived from the California Native Plant Society Inventory of Rare and Endangered Plants of California (2020)

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-3.** Special-status Species: Proposed Lower Drum Project Plants

Scientific Name	Common Name	Federal Status	State Status	CRPR <sup>4</sup>	Habitat Characteristics <sup>5</sup>	Impacts Analyzed?	Rationale
<i>Carex sheldonii</i>	Sheldon's sedge	None	None	2B.2	Mesic soils in lower montane coniferous forest, freshwater marshes and swamps, and riparian scrub. Elevation: 3,935–6,600 feet. Blooming period: May–August	No	Elevation of Proposed Projects is below species range.
<i>Carex xerophila</i>	chaparral sedge	None	None	1B.2	Serpentine and gabbro soils in chaparral, cismontane woodland, and lower montane coniferous forest. Elevation: 1,440–2,525 feet. Blooming period: March–June	Yes	Suitable habitat present.
<i>Ceanothus roderickii</i>	Pine Hill ceanothus	FE	SR	1B.1	Serpentine and gabbro soils in chaparral and cismontane woodland. Elevation: 800–3,575 feet. Blooming period: April–June	Yes	Suitable habitat present.
<i>Chlorogalum grandiflorum</i>	Red Hills soaproot	None	None	1B.2	Serpentine, gabbro, or other soils in chaparral, cismontane woodland, and lower montane coniferous forest. Elevation: 800–5,545 feet. Blooming period: May–June	Yes	Suitable habitat present.





**Table C-3.** Special-status Species: Proposed Lower Drum Project Plants

Scientific Name	Common Name	Federal Status	State Status	CRPR <sup>4</sup>	Habitat Characteristics <sup>5</sup>	Impacts Analyzed?	Rationale
<i>Chloropyron molle</i> ssp. <i>hispidum</i>	hispid bird's-beak	None	None	1B.1	Alkaline soils in meadows, seeps, playas, grassland. Elevation: 3–508 feet. Blooming period: June–September	No	Suitable habitat not present.
<i>Downingia pusilla</i>	dwarf downingia	None	None	2B.2	Vernal pools and mesic grassland. Elevation: 0–1,460 feet. Blooming period: March–May	No	Suitable habitat not present.
<i>Eryngium jepsonii</i>	Jepson's coyote thistle	None	None	1B.2	Clay soil in vernal pools and grassland. Elevation: 5–985 feet. Blooming period: April–August	No	Suitable habitat not present.
<i>Fremontodendron decumbens</i>	Pine Hill flannelbush	FE	SR	1B.2	Rocky gabbro or serpentine soils in chaparral and cismontane woodland. Elevation: 1,390–2,495 feet. Blooming period: April–July	Yes	Suitable habitat present.
<i>Galium californicum</i> ssp. <i>sierrae</i>	El Dorado bedstraw	FE	SR	1B.2	Gabbro soils in chaparral, cismontane woodland, and lower montane coniferous forest. Elevation: 325–1,920 feet. Blooming period: May–June	Yes	Suitable habitat present.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-3.** Special-status Species: Proposed Lower Drum Project Plants

Scientific Name	Common Name	Federal Status	State Status	CRPR <sup>4</sup>	Habitat Characteristics <sup>5</sup>	Impacts Analyzed?	Rationale
<i>Gratiola heterosepala</i>	Boggs Lake hedge-hyssop	None	SE	1B.2	Clay soils in vernal pools and lake margins of marshes and swamps. Elevation: 30–7,790 feet. Blooming period: April–August	Yes	Suitable habitat present.
<i>Horkelia parryi</i>	Parry's horkelia	None	None	1B.2	lone formations and other soils in chaparral and cismontane woodland. Elevation: 260–3,510 feet. Blooming period: April–September	Yes	Suitable habitat present.
<i>Juncus digitatus</i>	finger rush	None	None	1B.1	Vernal pools with xeric conditions and openings in cismontane woodland and lower montane coniferous forest. Elevation: 2,165–2,590 feet. Blooming period: April–June	Yes	Suitable habitat present.
<i>Juncus leiospermus</i> var. <i>ahartii</i>	Ahart's dwarf rush	None	None	1B.2	Mesic soils in grassland. Elevation: 95–750 feet. Blooming period: March–May	Yes	Suitable habitat present.



**Table C-3.** Special-status Species: Proposed Lower Drum Project Plants

Scientific Name	Common Name	Federal Status	State Status	CRPR <sup>4</sup>	Habitat Characteristics <sup>5</sup>	Impacts Analyzed?	Rationale
<i>Juncus leiospermus</i> var. <i>leiospermus</i>	Red Bluff dwarf rush	None	None	1B.1	Vernally mesic soils in chaparral, cismontane woodland, meadows, seeps, grassland, and vernal pools. Elevation: 110–4,100 feet. Blooming period: March–June	Yes	Suitable habitat present.
<i>Legenere limosa</i>	legenere	None	None	1B.1	Vernal pools. Elevation: 0–2,885 feet. Blooming period: April–June	No	Suitable habitat not present in areas proposed for disturbance.
<i>Lewisia cantelovii</i>	Cantelow's lewisia	None	None	1B.2	Mesic and granitic soils and occasionally serpentine seeps in broadleafed upland and lower montane coniferous forests, chaparral, and cismontane woodland. Elevation: 1,080–4,495 feet. Blooming period: May–October	Yes	Suitable habitat present.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-3.** Special-status Species: Proposed Lower Drum Project Plants

Scientific Name	Common Name	Federal Status	State Status	CRPR <sup>4</sup>	Habitat Characteristics <sup>5</sup>	Impacts Analyzed?	Rationale
<i>Lycopodiella inundata</i>	inundated bog club-moss	None	None	2B.2	Coastal bogs and fens, mesic lower montane coniferous forest, and lake margins of swamps and marshes. Elevation: 15–3,280 feet. Blooming period: June–September	Yes	Suitable habitat present.
<i>Monardella follettii</i>	Follett's monardella	None	None	1B.2	Rocky and serpentine soils in lower montane coniferous forest. Elevation: 1,965–6,560 feet. Blooming period: June–September	Yes	Suitable habitat present.
<i>Navarretia myersii</i> ssp. <i>myersii</i>	pincushion navarretia	None	None	1B.1	Often acidic soils in vernal pools. Elevation: 65–1,085 feet. Blooming period: April–May	No	Suitable habitat not present.
<i>Orcuttia viscida</i>	Sacramento Orcutt grass	FE	SE	1B.1	Vernal pools. Elevation: 98–328 feet. Blooming period: April–July (September)	No	Suitable habitat not present. Elevation of Proposed Projects is above species range.



**Table C-3.** Special-status Species: Proposed Lower Drum Project Plants

Scientific Name	Common Name	Federal Status	State Status	CRPR <sup>4</sup>	Habitat Characteristics <sup>5</sup>	Impacts Analyzed?	Rationale
<i>Packera layneae</i>	Layne's ragwort	FT	SR	1B.2	Rocky serpentine or gabbro soils in chaparral and cismontane woodland. Elevation: 655–3,560 feet. Blooming period: April–August	Yes	Suitable habitat present.
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	None	None	1B.2	Cismontane woodland, lower montane coniferous forest, meadows, and seeps. Elevation: 2,000–6,595 feet. Blooming period: May–July	Yes	Suitable habitat present.
<i>Poa sierrae</i>	Sierra blue grass	None	None	1B.3	Openings in lower montane coniferous forest. Elevation: 1,195–4,920 feet. Blooming period: April–July	Yes	Suitable habitat present.
<i>Rhynchospora Rhynchospora capitellata</i>	brownish beaked-rush	None	None	2B.2	Mesic soils in meadows, seeps, marshes, swamps, and montane coniferous forests. Elevation: 145–6,560 feet. Blooming period: July–August	Yes	Suitable habitat present.
<i>Sagittaria sanfordii</i>	Sanford's arrowhead	None	None	1B.2	Fresh water marshes and swamps that are typically shallow. Elevation: 0–2,132 feet. Blooming period: May–October	Yes	Suitable habitat present.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-3.** Special-status Species: Proposed Lower Drum Project Plants

Scientific Name	Common Name	Federal Status	State Status	CRPR <sup>4</sup>	Habitat Characteristics <sup>5</sup>	Impacts Analyzed?	Rationale
<i>Sidalcea stipularis</i>	Scadden Flat checkerbloom	None	SE	1B.1	Montane freshwater marshes and swamps. Elevation: 2,295–2,395 feet. Blooming period: July–August	No	Elevation of Proposed Projects is below species range.
<i>Streptanthus tortuosus</i> ssp. <i>truei</i>	True's mountain jewelflower	None	None	1B.1	Partially shaded on steep rocky slopes in lower montane coniferous forest. Elevation: 2,505–2,820 feet. Blooming period: June–July (September)	No	Elevation of Proposed Projects is below species range.
<i>Viburnum ellipticum</i>	oval-leaved viburnum	None	None	2B.3	Chaparral, cismontane woodland, lower montane coniferous forest. Elevation: 705–4,595 feet. Blooming period: May–June	Yes	Suitable habitat present.
<i>Wolffia brasiliensis</i>	Brazilian watermeal	None	None	2B.3	Shallow freshwater marshes and swamps. Elevation: 65–330 feet. Blooming period: April and December	No	Elevation of Proposed Projects is above species range.





**Table C-3.** Special-status Species: Proposed Lower Drum Project Plants

Scientific Name	Common Name	Federal Status	State Status	CRPR <sup>4</sup>	Habitat Characteristics <sup>5</sup>	Impacts Analyzed?	Rationale
<i>Wyethia reticulata</i>	El Dorado County mule ears	None	None	1B.2	Clay or gabbro soils in chaparral, cismontane woodland, lower montane coniferous forest. Elevation: 605–2,065 feet. Blooming period: April–August	Yes	Suitable habitat present.

Species Status:

Federal (USFWS and NMFS)

FE = Endangered

FT = Threatened

FC = Federal Candidate Species

State (CDFW)

SE = Endangered

ST = Threatened

SR = Rare

CRPR: 1B = Plants Rare, Threatened, or Endangered in California and elsewhere; 2B = Plants Rare, Threatened, or Endangered in California, but more common elsewhere

CRPR Threat Code Extension: None = Plants lacking any threat information, .1 = Seriously threatened in California (over 80 percent of occurrences threatened; high degree and immediacy of threat), .2 = Moderately threatened in California (20–80 percent of occurrences threatened; moderate degree and immediacy of threat), .3 = Not very threatened in California (<20 percent of occurrences threatened; low degree and immediacy of threat or no current threats known)

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-4.** Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Invertebrates</i>						
<i>Bombus occidentalis</i>	western bumble bee	—	SCE	Open grassy areas, urban parks and gardens, chaparral and shrub areas, and mountain meadows. Bumble bees require flowering plants that provide adequate pollen throughout the colony's life cycle, which can vary based on elevation, but typically ranges between early February to late November. Typically nests underground in abandoned rodent burrows, such as old squirrel or other animal nests, and in open west-southwest slopes bordered by trees, although a few nests have been reported from above-ground locations such as in logs among railroad ties. Availability of nests sites may depend on rodent abundance (IUCN 2020).	Yes	Suitable habitat present.



**Table C-4.** Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Branchinecta lynchi</i>	vernal pool fairy shrimp	FT	—	Endemic to the grasslands of the Central Valley and the Central and South Coast Range mountains of California, and the Agate Desert of southern Oregon. Found only in cool water vernal pools and vernal pool-like habitats; does not occur in riverine, marine, or other permanent bodies of water (USFWS 2007).	No	Suitable habitat not present.
<i>Desmocerus californicus dimorphus</i>	valley elderberry longhorn beetle	FT	—	Dependent on host plant, elderberry ( <i>Sambucus</i> spp.), which most commonly grows in riparian woodlands, but also in some upland habitats such as oak savannas and annual grasslands. Current presumed range in Central Valley extends from Shasta County south to Fresno County, including the valley floor and lower foothills up to approximately 500 feet in elevation (USFWS 2017).	Yes	Suitable habitat below 500 feet.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-4.** Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Lepidurus packardii</i>	vernal pool tadpole shrimp	FE	—	Found only in ephemeral freshwater habitats, including alkaline pools, clay flats, vernal lakes, vernal pools, vernal swales, and other seasonal wetlands. Patchily distributed across the Central Valley from Shasta County south to Tulare County with isolated occurrences in the East Bay Area (USFWS 2007).	No	Suitable habitat not present.



**Table C-4.** Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Fish</i>						
<i>Entosphenus tridentatus</i>	Pacific lamprey	—	SSC	Cold, clear water for spawning and incubation. Peak spawning appears to be closely tied to water temperatures that are suitable for early development, but can occur at temperatures above 22°C. Adults use gravel areas to build nests, while ammocoetes need soft sediments in which to burrow during rearing. Nests are generally associated with cover, including gravel and cobble substrates, vegetation and woody debris. Ammocoetes burrow into larger substrates as they grow. Ammocoetes also need detritus that produces algae for food and habitats with slow or moderately slow water velocities, such as low gradient riffles, pool tailouts and lateral scour pools (CDFW 2015).	No	Outside known species range.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-4.** Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Hypomesus transpacificus</i>	delta smelt	FT	SE	Endemic to open waters of San Francisco Bay and the Sacramento-San Joaquin River Delta. Distribution includes San Pablo Bay up through Suisun Bay, upstream through the Delta to the Sacramento River below Isleton, and the San Joaquin River below Mossdale. Spawning is thought to occur in sloughs and shallow edge-water channels in the upper Delta and in Montezuma Slough near Suisun Bay (USFWS 2010).	No	Outside of known species range.
<i>Lampetra ayresii</i>	western river lamprey	—	SSC	Occurs in the Sacramento-San Joaquin River systems, although it likely occurs elsewhere. Small lampreys that spend most of their lives in freshwater, with approximately three to four months in saltwater. Adults migrate into freshwater for spawning in autumn (Moyle 2002).	No	Outside known species range.





**Table C-4.** Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Oncorhynchus mykiss</i>	Steelhead – Central Valley DPS	FT	—	Includes naturally spawned anadromous steelhead originating below natural and manmade impassable barriers from the Sacramento and San Joaquin Rivers and their tributaries; excludes such fish originating from San Francisco and San Pablo Bays and their tributaries. This DPS includes steelhead from two artificial propagation programs: Coleman National Fish Hatchery Program and Feather River Fish Hatchery Program. Spawning habitat = gravel-bottomed, fast-flowing, well-oxygenated rivers and streams. Non-spawning = estuarine, marine waters (NOAA 2019).	Yes	Suitable habitat present.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-4.** Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Oncorhynchus tshawytscha</i> ESU spring-run	Central Valley spring-run Chinook salmon	FT	ST	Currently found in the Sacramento-San Joaquin River Delta, the Sacramento River and its tributaries, including American, Yuba and Feather rivers, and Mill, Deer and Butte Creeks. Numbers of adults dependent on pool depth and volume, amount of cover, and proximity to gravel. Water temperatures greater than 27°C are lethal to adults (NMFS 2016).	No	Outside known species range.



**Table C-4.** Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<b>Amphibians</b>						
<i>Rana boylei</i>	foothill yellow-legged frog	—	ST, SSC	Ranges in the northern half of California except for the Central Valley, Modoc Plateau, and eastern side of the Sierra Nevada Mountains. Generally found in shallow flowing streams and rivers with at least cobble sized substrate. Breeding generally occurs at the margins of wide shallow channels with reduced flow variation near tributary confluences. Specifically, egg masses are placed in low flow locations on or under rocks with preferred substrates being boulders, cobbles, or gravel. Eggs have been found at depths to 87 centimeters in water velocities of 0-0.21 meters per second and at most 12.5 meters from shore. Maximum water temperature for breeding is 26°C and 9°C to 21.5°C is the preferred range. Tadpoles avoid areas below 13°C and prefer temperatures between 16.5°C and 22.2°C (Thomson et al. 2016).	Yes	Suitable habitat present. Known populations in the Bear River (CDFW 2020a).

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-4.** Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Rana draytonii</i>	California red-legged frog	FT	SSC	Ponds/streams in humid forests, woodlands, grasslands, coastal scrub, and streambanks with plant cover in lowlands or foothills. Breeding habitat includes permanent or ephemeral water sources; lakes, ponds, reservoirs, slow streams, marshes, bogs, and swamps. Ephemeral wetland habitats require animal burrows or other moist refuges for estivation when the wetlands are dry. From sea level to 5,000 feet (1,525 meters). Occurs along the Coast Ranges from Mendocino County south to northern Baja California, and inland across the northernmost reaches of the Sacramento Valley and locally south through portions of the Sierra Nevada foothills as far south as northern Tulare County (Nafis 2020).	No	No known occurrences west of Interstate 80 with the exception of one near Bullard's Bar Reservoir ~20 miles north of Proposed Projects (CDFW 2020a).



**Table C-4.** Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Rana muscosa</i>	southern mountain yellow-legged frog	FE	SE	Lakes, ponds, meadow streams, isolated pools, and sunny riverbanks in the southern Sierra Nevada Mountains. Rocky streams in narrow canyons and in the chaparral belt in the mountains of southern California. Found from 984 feet to above 12,000 feet (370–3,660 meters) in elevation (Nafis 2020).	No	Proposed Projects are outside of known species range (CDFW 2020a).
<i>Rana sierrae</i>	Sierra Nevada yellow-legged frog	FE	ST	Inhabits lakes, ponds, meadow streams, isolated pools, and sunny riverbanks in the Sierra Nevada mountains. Open stream and lake edges with a gentle slope up to a depth of 2–3 inches (5–8 centimeters) seem to be preferred. Waters that do not freeze to the bottom and which do not dry up are required. Known from 984–12,000 feet (298–3,626 meters) (Nafis 2020).	Yes	Suitable habitat present.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-4.** Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Spea hammondi</i>	western spadefoot	—	SSC	Generally found in grasslands, oak woodlands, coastal sage scrub, and chaparral in washes, floodplains, alluvial fans, playas, and alkali flats. Natural and artificial water bodies are used for breeding. Specifically, vernal pools used by this species have an average ponding duration of 81 days, and successful recruitment occurs in ponds that last on average 21 days longer than larval development time. Pool temperature requirements are from 48 to 90°F. Pools with invasive species, such as crayfish ( <i>Pacifasticus</i> spp.) or American bullfrogs ( <i>Lithobates catesbeianus</i> ), often, but not always, exclude this species (Thomson et al. 2016).	No	Suitable habitat not present.



**Table C-4.** Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Reptiles</i>						
<i>Actinemys (Emys) marmorata</i>	northwestern (western) pond turtle	—	SSC	Ranges throughout California except for Inyo and Mono Counties. Generally occurs in various water bodies including permanent and ephemeral systems either natural or artificial. Upland habitat that is at least moderately undisturbed is required for nesting and overwintering, in soils that are loose enough for excavation (Thomson et al. 2016).	Yes	Suitable habitat present.
<i>Phrynosoma balinivilli</i>	Blainville's (coast) horned lizard	—	SSC	The species is known to occur in valley-foothill hardwood, riparian, and conifer habitats, and occasionally grasslands. They range from the Sierra Nevada foothills and throughout the central California coast. Individuals utilize loose soils for burrowing, forage in open areas or between shrubs, and do not require permanent water (CDFW 2020c).	Yes	Suitable habitat present.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-4.** Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Thamnophis gigas</i>	giant garter snake	FT	ST	Marshes, sloughs, ponds, small lakes, low gradient streams, irrigation and drainage canals, rice fields and their associated uplands. Upland habitat should have burrows or other soil crevices suitable for snakes to reside during their dormancy period (November to mid-March). Ranges in the Central Valley from Butte County to Buena Vista Lake in Kern County (USFWS 2012).	No	Outside of existing species range (USFWS 2020).
<b>Birds</b>						





**Table C-4.** Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Accipiter gentilis</i>	northern goshawk	—	SSC	Mature and old-growth forests including Ponderosa pine ( <i>Pinus ponderosa</i> ), Jeffrey pine ( <i>Pinus jeffreyi</i> ), Lodgepole pine ( <i>Pinus contorta</i> ), mixed conifer, Douglas-fir ( <i>Pseudotsuga menziesii</i> ), mixed Redwood-Douglas-fir hardwood, and quaking aspen ( <i>Populus tremuloides</i> ). Occurs in North Coast Ranges through Sierra Nevada, Klamath, Cascade, and Warner Mountains, in Mount Pinos and San Jacinto, San Bernardino, and White Mountains (Shuford and Gardali 2008).	Yes	Suitable habitat present.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-4.** Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Agelaius tricolor</i>	tricolored blackbird	—	ST, SSC	Preferred nesting habitat includes cattails and bulrushes ( <i>Typha</i> spp.), Himalayan blackberry ( <i>Rubus armeniacus</i> ), and agricultural silage. Dense vegetation is preferred but heavily lodged cattails not burned in recent years may preclude settlement. Need access to open water. Strips of emergent vegetation along canals are avoided as nest sites unless they are approximately 10 or more meters wide but, in some ponds, especially where associated with Himalayan blackberries and deep water, settlement may be in narrower fetches of cattails (Hamilton 2004). Mostly a year-round resident in California. Common locally throughout Central Valley and in coastal districts from Sonoma County south. Breeds locally in northeastern California. In winter, becomes more widespread along central coast and San Francisco Bay area, and can be found in portions of the Colorado Desert (CDFW 2020c).	Yes	Suitable habitat present.



**Table C-4.** Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Ammodramus savannarum</i>	grasshopper sparrow	—	SSC	Known to breed in grassland habitats throughout the northeastern and mid-Atlantic U.S., southeastern Canada, coastal and Central Valley of California, and a few other areas of Canada and northern Mexico (Shuford and Gardali 2008). In the east and midwest, tallgrass and mixed grass prairie is preferred, whereas in the west and southwest the species typically uses shortgrass and semidesert grasslands. Additionally, individuals can sometimes be found in corn ( <i>Zea mays</i> ) and oat ( <i>Avena sativa</i> ) fields and avoid areas with high shrub cover (Shuford and Gardali 2008).	Yes	Suitable habitat present.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-4.** Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Athene cunicularia</i>	burrowing owl	—	SSC	Species known to be a yearlong resident of open, dry grasslands and varying desert habitats (CDFW 2020). Nesting habitat includes open areas with mammal burrows, including rolling hills, grasslands, fallow fields, sparsely vegetated desert scrub, vacant lots and human disturbed lands. Soils must be friable for burrows (Bates 2006).	No	Species has potential to occur in migration or nonbreeding season, but Proposed Projects are outside nesting range of species and all occurrences are much lower in elevation than the Proposed Projects (CDFW 2020a).



**Table C-4.** Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Aquila chrysaetos</i>	golden eagle	BGEPA	FP	Habitat includes rolling foothills and mountain terrain, wide arid plateaus deeply cut by streams and canyons, open mountain slopes, and cliffs and rock outcrops. Uncommon resident in hills and mountains throughout California, and an uncommon migrant and winter resident in the Central Valley and Mojave Desert (CDFW 2020c).	Yes	Suitable habitat present.
<i>Aythya americana</i>	redhead	—	SSC	Usually nest in freshwater emergent wetlands where dense stands of cattails ( <i>Typha</i> spp.) and tules ( <i>Schoenoplectus</i> spp.) are interspersed with areas of deep, open water. Also observed nesting in somewhat alkaline marshes and potholes (Shuford and Gardali 2008).	No	Species has potential to occur in migration or nonbreeding season, but Proposed Projects are outside nesting range <sup>6</sup> of species (CDFW 2020a).

<sup>6</sup> Only nesting redheads are protected (CDFW 2020d)

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-4.** Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Buteo swainsoni</i>	Swainson's hawk	—	ST	Nests in stands with few trees in riparian areas, juniper-sage flats, and oak savannah. Forages in adjacent grasslands, agricultural fields and pastures. Breeding resident and migrant in the Central Valley, Klamath Basin, Northeastern Plateau, Lassen Co., and Mojave Desert. Very limited breeding reported from Lanfair Valley, Owens Valley, Fish Lake Valley, and Antelope Valley (CDFW 2020c).	No	Species has potential to occur in migration or nonbreeding season, but Proposed Projects are outside nesting range of species (CDFW 2020a). Impacts to non-nesting hawks are not anticipated.



**Table C-4.** Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Chlidonias niger</i>	black tern	—	SSC	Uses fresh emergent wetlands, lakes, ponds, moist grasslands, and agricultural fields. In migration, some take coastal routes and forage offshore (CDFW 2020c).	No	Species has potential to occur in migration or nonbreeding season, but Proposed Projects are outside nesting range <sup>7</sup> of species (CDFW 2020a).

<sup>7</sup> Only nesting colonies are protected (CDFW 2020d)

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-4.** Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Circus hudsonius</i>	northern harrier	—	SSC	Nest on the ground in patches of dense, tall vegetation in undisturbed areas. Breed and forage in variety of open habitats such as marshes, wet meadows, weedy borders of lakes, rivers and streams, grasslands, pastures, croplands, sagebrush flats and desert sinks (Shuford and Gardali 2008).	No	Species has potential to occur in migration or nonbreeding season, but Proposed Projects are outside nesting range <sup>8</sup> of species (CDFW 2020a).
<i>Contopus cooperi</i>	olive-sided flycatcher	—	SSC	Nests in a wide variety of forest and woodland habitats below 9,000 feet in the coastal and mountainous portions of the state (occurs only as a migrant elsewhere). Prefers forests and woodlands with adjacent meadows, lakes or open terrain for foraging (CDFW 2020c).	Yes	Suitable habitat present.

<sup>8</sup> Only nesting northern harriers are protected (CDFW 2020d)





**Table C-4.** Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Cypseloides niger</i>	black swift	—	SSC	Breeding sites are very specific: behind or beside permanent or semipermanent waterfalls, on perpendicular cliffs near water and in sea caves. Breeds very locally in the Sierra Nevada and Cascade Range, the San Gabriel, San Bernardino, and San Jacinto Mountains, and in coastal bluffs and mountains from San mateo County south to San Luis Obispo County (Shuford and Gardali 2008).	No	Suitable habitat not present.
<i>Elanus leucurus</i>	white-tailed kite	—	FP	Occurs in herbaceous and open stages of valley lowland habitats, usually near agricultural land. Forages in undisturbed, open grasslands, meadows, farmlands and emergent wetlands (CDFW 2020). Typically nest in the upper third of trees that may be 10–160 feet (33–525 meters) tall. These can be open-country trees growing in isolation, or at the edge of or within a forest (Cornell 2019).	Yes	Suitable habitat present.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-4.** Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Empidonax traillii</i>	willow flycatcher	—	SE	Summer resident in wet meadows and montane riparian habitats from 2,000–8,000 feet elevation in the Sierra Nevada and Cascade Ranges. Most often found in open river valleys or large mountain meadows with lush shrubby willows. Has been observed breeding along the Santa Ynez River in Santa Barbara County, and along the Santa Clara River in Ventura County (CDFW 2020c).	No	Species has potential to occur in migration or nonbreeding season, but Proposed Projects are outside nesting range of species (CDFW 2020a). Impacts to non-nesting birds are not anticipated.
<i>Falco peregrinus</i>	American peregrine falcon	—	FP	Breeds near wetlands lakes, rivers, or other waters on cliffs, banks, dunes or mounds, mostly in woodland, forest and coastal habitats. Nest is a scrape on a depression or ledge in an open site. May use human-made structures, snags, or trees for nesting (CDFW 2020c).	Yes	Suitable habitat present.



**Table C-4.** Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Haliaeetus leucocephalus</i>	bald eagle	BGEPA	SE, FP	Nests in large, old-growth, or dominant live tree with open branchwork, especially ponderosa pine. Requires large bodies of water or rivers with abundant fish, and adjacent snags. Permanent resident, and uncommon winter migrant, now restricted to breeding mostly in Butte, Lake, Lassen, Modoc, Plumas, Shasta, Siskiyou, and Trinity Counties. About half of the wintering population is in the Klamath Basin (CDFW 2020c).	Yes	Suitable habitat present.
<i>Icteria virens</i>	yellow breasted chat	None	SSC	Nest in early-successional riparian habitats with a well-developed shrub layer and an open canopy. Restricted to narrow border of streams, creeks, sloughs and rivers. Often nest in dense thicket plants such as blackberry and willow (Shuford and Gardali 2008).	Yes	Suitable habitat present.
<i>Lanius ludovicianus</i>	loggerhead shrike	—	SSC	Breed in shrublands or open woodlands with a fair amount of grass cover and areas of bare ground (Shuford and Gardali 2008).	Yes	Suitable habitat present.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-4.** Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Laterallus jamaicensis coturniculus</i>	California black rail	—	ST, FP	Saline, brackish, and fresh emergent wetlands. Scarce, but true abundance difficult to determine due to small size and extremely secretive nature. Known to nest at scattered locations in the San Francisco Bay Area and Delta region, Point Reyes National Seashore, San Luis Obispo and Orange Counties, as well as the Imperial and Lower Colorado River Valleys. Appears intermittently and sparingly at a few locations in the Sacramento Valley (CDFW 2020c).	Yes	Suitable habitat present.
<i>Melospiza melodia</i>	song sparrow (Modesto pop.)	—	SSC	Often found in emergent freshwater marshes dominated by tules ( <i>Scirpus</i> spp.) and cattails ( <i>Typha</i> spp.) as well as riparian willow ( <i>Salix</i> spp.). Also nest in riparian forests of Valley oak ( <i>Quercus lobata</i> ) with a sufficient understory of blackberry ( <i>Rubus</i> spp.), along vegetated irrigation canals and levees, and in recently planted Valley oak restoration sites. They are found throughout the Sacramento Valley, from the Delta north to Chico (Shuford and Gardali 2008).	Yes	Suitable habitat present.



**Table C-4.** Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Pelecanus erythrorhynchos</i>	American white pelican	—	SSC	In California, nests only in large lakes in Klamath Basin. Roosts along water edges, beaches, sandbars, or old driftwood (CDFW 2020c).	No	Species has potential to occur in migration or nonbreeding season, but outside nesting range <sup>9</sup> of species (CDFW 2020a).

<sup>9</sup> Only nesting colonies protected (CDFW 2020d)

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-4.** Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Progne subis</i>	purple martin	—	SSC	Inhabits open forests, woodlands, and riparian areas in breeding season. Found in a variety of open habitats during migration, including grassland, wet meadow, and fresh emergent wetland, usually near water. In southern California, now only a rare and local breeder on the coast and in interior mountain ranges, with few breeding localities. Absent from higher desert regions except as a rare migrant. In northern California, an uncommon to rare local breeder on the coast and inland to Modoc and Lassen Counties (Zeiner et al. 1988, 1989, 1990).	Yes	Suitable habitat present.



**Table C-4.** Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Riparia</i>	bank swallow	—	ST	Riparian, lacustrine, and coastal areas with vertical banks, bluffs or cliffs with fine-textured or sandy soils, into which it digs nesting holes. Also nests in earthen banks as well as sand and gravel pits (CDFW 2020). Species primarily found on the Feather and Sacramento Rivers in California (CDFW 2020c).	No	Species has potential to occur in migration or nonbreeding season, but outside nesting range of species (CDFW 2020a). Impacts on non-nesting birds not anticipated.
<i>Setophaga petechia</i>	yellow warbler	—	SSC	Usually found in riparian deciduous habitats in summer: cottonwoods ( <i>Populus</i> spp.), willows ( <i>Salix</i> spp.), alders ( <i>Alnus</i> spp.), and other small trees and shrubs typical of low, open-canopy riparian woodland. Also breeds in montane shrubbery in open conifer forests (CDFW 2020c).	Yes	Suitable habitat present.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-4.** Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Strix nebulosa</i>	great gray owl	—	SE	Breeds in red fir, mixed conifer, or lodgepole pine habitats, always near wet meadows. Nests in large, broken-topped snags usually 25–72 feet (8–23 meters) above the ground. Elevation range is 4,500–7,500 feet (1,400 to 2,300 meters) in the Sierra Nevada from the vicinity of Quincy, Plumas Counties south to the Yosemite region (CDFW 2020c).	No	Proposed Projects are entirely below elevation range of the species.
<i>Strix occidentalis</i>	California spotted owl	—	SSC	Older forests in areas of high canopy cover, with a multi-layered canopy, old decadent trees, a high number of large trees, and coarse downed woody debris. In California, ranges throughout the west slopes of the Sierra Nevada Mountains, and down the Coast Range Mountains from Carmel south through the Transverse Ranges nearly to Baja California (Shuford and Gardali 2008).	Yes	Suitable habitat present.





**Table C-4.** Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Xanthocephalus xanthocephalus</i>	yellow-headed blackbird	—	SSC	Nest in marshes with tall, emergent vegetation (e.g., tules and cattails) adjacent to deep water (Shuford and Gardali 2008).	No	Species has potential to occur in migration or nonbreeding season, but outside nesting range <sup>10</sup> of species (CDFW 2020a).
<b>Mammals</b>						
<i>Antrozous pallidus</i>	pallid bat	—	SSC	Ranges across nearly all of California except for high elevation portions of the Sierra Nevada Mountains and Del Norte, western Siskiyou, Humboldt, and northern Mendocino Counties. Generally found in a wide variety of habitats but with some preference for drier areas. Day roosts are in caves, crevices, mines, and occasionally in hollow trees and buildings (CDFW 2020c).	Yes	Suitable habitat present.

<sup>10</sup> Only nesting yellow-headed blackbirds protected (CDFW 2020d)

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-4.** Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Aplodontia rufa californica</i>	Sierra Nevada mountain beaver	—	SSC	Ranges in the Cascade, Klamath, and Sierra Nevada Mountains. Generally found in dense riparian forests and open shrubscapes around most forests. Specifically found with open to moderate canopy cover with a dense understory near water. This species requires deep friable soils and a cool moist microclimate (CDFW 2020c).	Yes	Suitable habitat present.
<i>Corynorhinus townsendii</i>	Townsend's big-eared bat	—	SSC	Ranges throughout California except for high elevation portions of the Sierra Nevada Mountains. Generally prefers mesic habitats but known to occur in all non-alpine habitats of California. Roosting occurs in caves, tunnels, mines, buildings, or other structures and this species may use different roosting sites for day and night (CDFW 2020c).	Yes	Suitable habitat present.



**Table C-4.** Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Euderma maculatum</i>	spotted bat	—	SSC	Ranges along the eastern half of California as well as all of southern California except for Orange County and southern Los Angeles County. Generally occurs in desert, mixed conifer, and grassland habitats. Specifically, this species prefers to roost in rock crevices on cliffs but will sometimes use caves and buildings (CDFW 2020c).	Yes	Suitable habitat present.
<i>Lasiurus blossevillii</i>	western red bat	—	SSC	Ranges in the western half of California except for Del Norte and Humboldt Counties. Generally occurs in most habitats except for the desert. Roosts in trees, sometimes shrubs, and typically at the margins of habitats (CDFW 2020c).	Yes	Suitable habitat present.
<i>Pekania pennanti</i>	fisher	—	SSC	Large areas of mature, dense forest stands with snags and greater than 50% canopy closure. Uncommon permanent resident of the Sierra Nevada, Cascades, and Klamath Mountains; also found in a few areas in the North Coast Ranges (USFWS 2014).	Yes	Suitable habitat present.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-4.** Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Taxidea taxus</i>	American badger	—	SSC	Ranges in all of California except the extreme northwest corner. Generally found in drier open areas of habitats with friable soils (CDFW 2020c).	Yes	Suitable habitat present.
<i>Vulpes macrotis</i>	San Joaquin kit fox	FE	ST	Occur in desert-like habitats characterized by sparse or absent shrub cover, sparse ground cover, and short vegetative structure. Areas having open, level, sandy ground (USFWS 2010).	No	Suitable habitat not present and Proposed Projects are outside of known species range (CDFW 2020a).



**Table C-4.** Special-status Species: Proposed Lower Drum Project Wildlife

Scientific Name	Common Name	Federal Status	State Status	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Vulpes necator</i>	Sierra Nevada red fox	FC	ST	Found in a variety of habitats, including alpine dwarf-shrub, wet meadow, subalpine conifer, lodgepole pine, red fir, aspen, montane chaparral, montane riparian, mixed conifer, Jeffrey pine, eastside pine, montane hardwood-conifer, and ponderosa pine. Most sightings above 7,000 feet (2,134 meters), ranging from 3,900–11,900 feet (1,189–3,627 meters). Dens in rocky outcrops, hollow logs and stumps, and burrows in friable soil (CDFW 2020c).	Yes	Suitable habitat present.

Source: California Department of Fish and Wildlife., November 2018., Special Animals List., <https://www.wildlife.ca.gov/Data/CNDDDB/Plants-and-Animals>, CDFW Biogeographic Data Branch., Sacramento.

Species Status:

Federal (USFWS and NMFS)

BGEPA =Bald and Golden Eagle Protection Act

FE = Endangered

FT = Threatened

FCE = Candidate Endangered

FCT = Candidate Threatened

Appendix C Biological Resources Information  
PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
and Lower Drum Hydroelectric Project (FERC No. 14531)

FCD = Candidate for delisting

State (CDFW)

SE = Endangered

ST = Threatened

SCE = Candidate Endangered

SCT = Candidate Threatened

SCD = Candidate for delisting

FP = Fully Protected

SSC = Species of Special Concern



**Table C-5.** Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR <sup>11</sup>	Habitat Characteristics <sup>12</sup>	Impacts Analyzed	Rationale
<i>Arabis rigidissima</i> var. <i>demota</i>	Galena Creek rockcress	—	—	FSS	1B.2	Rocky soil in broadleaf upland and upper montane coniferous forests. Elevation: 7,395–8,400 feet. Blooming period: July–August	Yes	Suitable habitat present.
<i>Artemisia tripartita</i> ssp. <i>tripartita</i>	threetip sagebrush	—	—	—	2B.3	Rocky and volcanic soils in openings of upper montane coniferous forest. Elevation: 7,215–8,530 feet. Blooming period: August	Yes	Suitable habitat present.

<sup>11</sup> California Rare Plant Rank

<sup>12</sup> All plant habitat descriptions derived from the California Native Plant Society Inventory of Rare and Endangered Plants of California (2020)

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-5.** Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR <sup>11</sup>	Habitat Characteristics <sup>12</sup>	Impacts Analyzed	Rationale
<i>Asplenium viride</i>	green spleenwort	—	—	—	2B.3	Rocky, granitic, or carbonate soils in subalpine coniferous scrub. Elevation: 6,725 feet. Blooming period: June–August	Yes	Suitable habitat present.
<i>Astragalus austiniiae</i>	Austin's astragalus	—	—	—	1B.3	Rocky soil in subalpine coniferous forest and alpine boulder and rock fields. Elevation: 8,005–9,745 feet. Blooming period (May) July–September	No	This species elevation range is more than 200 feet outside elevation range of Proposed Projects.





**Table C-5.** Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR <sup>11</sup>	Habitat Characteristics <sup>12</sup>	Impacts Analyzed	Rationale
<i>Astragalus lemmonii</i>	Lemmon's milk-vetch	—	—	FSS	1B.2	Great Basin scrub, meadows, seeps, and the lake shores of marshes and swamps. Elevation: 3,300–7,220 feet. Blooming period: May–September	Yes	Suitable habitat present.
<i>Astragalus pulsiferae</i> var. <i>coronensis</i>	Modoc Plateau milk-vetch	—	—	FSS	4.2	Sandy, gravelly, or volcanic soils in Great Basin scrub, lower montane coniferous forest, and pinyon and juniper woodland. Elevation: 4,400–6,200 feet. Blooming period: May–July	Yes	Suitable habitat present.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-5.** Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR <sup>11</sup>	Habitat Characteristics <sup>12</sup>	Impacts Analyzed	Rationale
<i>Astragalus webberi</i>	Webber's milk-vetch	—	—	FSS	1B.2	Meadows, seeps, and broadleaved and lower montane coniferous forests. Elevation: 2,400–4,100 feet. Blooming period: May–July	Yes	Suitable habitat present.
<i>Boletus pulcherrimus</i>	red-pored bolete	—	—	FSS	—	Mixed hardwood and conifer woodlands. Elevation range: Below 8,500 feet. Spring period: November–February (MykoWeb 2020).	No	Species primarily known in coastal forests north of San Francisco



**Table C-5.** Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR <sup>11</sup>	Habitat Characteristics <sup>12</sup>	Impacts Analyzed	Rationale
<i>Botrychium ascendens</i>	upswept moonwort	—	—	FSS	2B.3	Mesic soil in meadows, seeps, and lower montane coniferous forest. Elevation: 3,655–8,860 feet. Sporing period: July–August	Yes	Suitable habitat present.
<i>Botrychium crenulatum</i>	scalloped moonwort	—	—	FSS	2B.2	Bogs, fens, meadows, seeps, marshes, freshwater swamps, montane coniferous forests. Elevation: 4,159–10,758 feet. Sporing period: June–September	Yes	Species was found in Proposed Projects.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-5.** Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR <sup>11</sup>	Habitat Characteristics <sup>12</sup>	Impacts Analyzed	Rationale
<i>Botrychium lunaria</i>	common moonwort	—	—	FSS	2B.3	Meadows, seeps, upper montane and subalpine coniferous forest. Elevation: 6,495–11,155 feet. Spring period: August	Yes	Suitable habitat present.
<i>Botrychium minganense</i>	Mingan moonwort	—	—	FSS	2B.2	Mesic soils in bogs, fens, lower and upper montane coniferous forest. Elevation: 4,773–7,152 feet. Spring period: July–September	Yes	Suitable habitat present.



**Table C-5.** Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR <sup>11</sup>	Habitat Characteristics <sup>12</sup>	Impacts Analyzed	Rationale
<i>Botrychium montanum</i>	western goblin	—	—	FSS	2B.1	Mesic soil in meadows, seeps, and montane coniferous forest. Elevation: 4,805–7,150 feet. Sporing period: July–September	Yes	Suitable habitat present.
<i>Brasenia schreberi</i>	watershield	—	—	—	2B.3	Freshwater marshes and swamps. Elevation: 95–7,220 feet. Blooming period: June–September	Yes	Suitable habitat present.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-5.** Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR <sup>11</sup>	Habitat Characteristics <sup>12</sup>	Impacts Analyzed	Rationale
<i>Bruchia bolanderi</i>	moss	—	—	FSS	4.2	Damp soil in meadows, seeps, and montane coniferous forests. Elevation: 5,575–9,185 feet.	Yes	Suitable habitat present.
<i>Calystegia stebbinsii</i>	Stebbins' morning-glory	FE	SE	—	1B.1	Serpentine or gabbro soils in openings of chaparral and cismontane woodland. Elevation: 605–3,575 feet. Blooming period: April–July	Yes	Suitable habitat present.



**Table C-5.** Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR <sup>11</sup>	Habitat Characteristics <sup>12</sup>	Impacts Analyzed	Rationale
<i>Calystegia vanzuukiae</i>	Van Zuuk's morning-glory	—	—	—	1B.3	Serpentine or gabbro soils in chaparral and cismontane woodland. Elevation: 1,640–3,870 feet. Blooming period: May–August	Yes	Suitable habitat present.
<i>Carex davyi</i>	Davy's sedge	—	—	—	1B.3	Upper and subalpine coniferous forests. Elevation: 4,920–10,500 feet. Blooming period: May–August	Yes	Suitable habitat present.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-5.** Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR <sup>11</sup>	Habitat Characteristics <sup>12</sup>	Impacts Analyzed	Rationale
<i>Carex lasiocarpa</i>	woolly-fruited sedge	—	—	—	2B.3	Bogs, fens, freshwater marshes and swamps, and lake margins. Elevation: 5,575–6,890 feet. Blooming period: June–July	Yes	Suitable habitat present.
<i>Carex limosa</i>	mud sedge	—	—	—	2B.2	Bogs, fens, meadows, seeps, marshes, swamps, and montane coniferous forests. Elevation: 3,935–8,860 feet. Blooming period: June–August	Yes	Suitable habitat present.





**Table C-5.** Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR <sup>11</sup>	Habitat Characteristics <sup>12</sup>	Impacts Analyzed	Rationale
<i>Carex sheldonii</i>	Sheldon's sedge	—	—	—	2B.2	Mesic soils in lower montane coniferous forest, freshwater marshes and swamps, and riparian scrub. Elevation: 3,935–6,600 feet. Blooming period: May–August	Yes	Suitable habitat present.
<i>Chlorogalum grandiflorum</i>	Red Hills soaproot	—	—	—	1B.2	Serpentine, gabbro, or other soils in chaparral, cismontane woodland, and lower montane coniferous forest. Elevation: 800–5,545 feet. Blooming period: May–June	Yes	Suitable habitat present.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-5.** Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR <sup>11</sup>	Habitat Characteristics <sup>12</sup>	Impacts Analyzed	Rationale
<i>Claytonia megarhiza</i>	fell-fields claytonia	—	—	—	2B.3	In rock crevices of subalpine coniferous forest and alpine boulder and rock fields. Elevation: 8,530–11,590 feet. Blooming period: July–September	No	Species elevation range is more than 200 feet outside elevation range of Proposed Projects.
<i>Corallorhiza trifida</i>	northern coralroot	—	—	—	2B.1	Mesic soils in lower montane coniferous forest and the edges of meadows and seeps. Elevation: 4,490–5,725 feet. Blooming period: June–July	Yes	Suitable habitat present.



**Table C-5.** Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR <sup>11</sup>	Habitat Characteristics <sup>12</sup>	Impacts Analyzed	Rationale
<i>Crepis runcinata</i>	fiddleleaf hawksbeard	—	—	—	2B.2	Mesic or alkaline soils in Mojavean desert scrub and pinyon and juniper woodland. Elevation: 4,100–6,480 feet. Blooming period: May–August	No	Habitat for this species is not present.
<i>Cyripedium fasciculatum</i>	clustered lady's slipper	—	—	FSS	4.2	Serpentine seeps and streambanks in lower montane and north coast coniferous forest. Elevation: 325–7,990 feet. Blooming period: March–August	Yes	Suitable habitat present.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-5.** Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR <sup>11</sup>	Habitat Characteristics <sup>12</sup>	Impacts Analyzed	Rationale
<i>Cypripedium montanum</i>	mountain lady's slipper	—	—	FSS	4.2	Cismontane woodland, broadleaved, lower montane and north coast coniferous forests. Elevation: 605–7,300 feet. Blooming period: March–August	No	Species is not known from Vicinity of Proposed Projects.
<i>Dendrocollybia racemosa</i>	branched collybia	—	—	FSS	—	Mixed hardwood-conifer woodlands. Elevation: Unknown. Spring period: November–February (MykoWeb 2020).	Yes	Suitable habitat present.



**Table C-5.** Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR <sup>11</sup>	Habitat Characteristics <sup>12</sup>	Impacts Analyzed	Rationale
<i>Drosera anglica</i>	English sundew	—	—	—	2B.3	Bogs, fens, meadows, and seeps. Elevation: 4,265–7,400 feet. Blooming period: June–September	Yes	Suitable habitat present.
<i>Erigeron miser</i>	starved daisy	—	—	FSS	1B.3	Upper montane coniferous forest. Elevation: 6,035–8,595 feet. Blooming period: June–October	Yes	Suitable habitat present.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-5.** Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR <sup>11</sup>	Habitat Characteristics <sup>12</sup>	Impacts Analyzed	Rationale
<i>Eriogonum umbellatum</i> var. <i>torreyanum</i>	Donner Pass buckwheat	—	—	FSS	1B.2	Rocky and volcanic soils in meadows, seeps, and upper montane coniferous forest. Elevation: 6,085–8,595 feet. Blooming period: July–September	Yes	Suitable habitat present.
<i>Eryngium jepsonii</i>	Jepson's coyote thistle	—	—	—	1B.2	Clay soil in vernal pools and grassland. Elevation: 5–985 feet. Blooming period: April–August	No	Species elevation range is more than 200 feet outside elevation range of Proposed Projects.



**Table C-5.** Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR <sup>11</sup>	Habitat Characteristics <sup>12</sup>	Impacts Analyzed	Rationale
<i>Fritillaria eastwoodiae</i>	Butte County fritillary	—	—	FSS	3.2	Sometimes serpentine soils in chaparral, cismontane woodland, and lower montane coniferous forest. Elevation: 160–4,920 feet. Blooming period: March–June	Yes	Suitable habitat present.
<i>Helodium blandowii</i>	Blandow's bog moss	—	—	FSS	2B.3	Damp soil in meadows, seeps, and subalpine coniferous forest. Elevation: 6,105–8,860 feet.	Yes	Suitable habitat present.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-5.** Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR <sup>11</sup>	Habitat Characteristics <sup>12</sup>	Impacts Analyzed	Rationale
<i>Ivesia aperta</i> var. <i>aperta</i>	Sierra Valley ivesia	—	—	FSS	1B.2	Vernally mesic soils that are usually volcanic in Great Basin scrub, lower montane coniferous forest, meadows, seeps, vernal pools, and pinyon and juniper woodland. Elevation: 4,855–7,545 feet. Blooming period: June–September	Yes	Suitable habitat present.





**Table C-5.** Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR <sup>11</sup>	Habitat Characteristics <sup>12</sup>	Impacts Analyzed	Rationale
<i>Ivesia aperta</i> var. <i>canina</i>	Dog Valley ivesia	—	—	FSS	1B.1	Volcanic and rocky soils in openings of lower montane coniferous forest and xeric conditions of meadows and seeps. Elevation: 5,245–6,560 feet. Blooming period: June–August	Yes	Suitable habitat present.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-5.** Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR <sup>11</sup>	Habitat Characteristics <sup>12</sup>	Impacts Analyzed	Rationale
<i>Ivesia sericoleuca</i>	Plumas ivesia	—	—	FSS	1B.2	Vernally mesic soils that are usually volcanic in Great Basin scrub, vernal pools, meadows seeps, and lower montane coniferous forest. Elevation: 4,295–7,220 feet. Blooming period: May–October	Yes	Suitable habitat present.



**Table C-5.** Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR <sup>11</sup>	Habitat Characteristics <sup>12</sup>	Impacts Analyzed	Rationale
<i>Ivesia webberi</i>	Webber's ivesia	—	—	FSS	1B.1	Sandy or gravelly soils in volcanic ashy Great Basin scrub, lower montane coniferous forest, and pinyon and juniper woodland. Elevation: 3,280–6,810 feet. Blooming period: May–July	Yes	Suitable habitat present.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-5.** Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR <sup>11</sup>	Habitat Characteristics <sup>12</sup>	Impacts Analyzed	Rationale
<i>Juncus luciensis</i>	Santa Lucia dwarf rush	—	—	FSS	1B.2	Chaparral, Great Basin scrub, lower montane coniferous forest, meadows and seeps, and vernal pools. Elevation: 984–6,693 feet. Blooming period: April–July	Yes	Suitable habitat present.



**Table C-5.** Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR <sup>11</sup>	Habitat Characteristics <sup>12</sup>	Impacts Analyzed	Rationale
<i>Lewisia cantelovii</i>	Cantelow's lewisia	—	—	FSS	1B.2	Mesic and granitic soils and occasionally serpentine seeps in broadleaved upland and lower montane coniferous forests, chaparral, and cismontane woodland. Elevation: 1,080–4,495 feet. Blooming period: May–October	Yes	Suitable habitat present.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-5.** Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR <sup>11</sup>	Habitat Characteristics <sup>12</sup>	Impacts Analyzed	Rationale
<i>Lewisia kelloggii</i> ssp. <i>hutchison</i>	Hutchison's lewisia	—	—	FSS	3.2	Often in slate soils or sometimes rhyolite tuff in openings and ridgetops of upper montane coniferous forest. Elevation: 2,505–7,760 feet. Blooming period: April–August	Yes	Suitable habitat present.



**Table C-5.** Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR <sup>11</sup>	Habitat Characteristics <sup>12</sup>	Impacts Analyzed	Rationale
<i>Lewisia kelloggii</i> ssp. <i>kelloggii</i>	Kellog's lewisia	—	—	FSS	3.2	Often in slate soils or sometimes rhyolite tuff in openings and ridgetops of upper montane coniferous forest. Elevation: 4,805–7,760 feet. Blooming period: April–August	Yes	Suitable habitat present.
<i>Lewisia longipetala</i>	long-petaled lewisia	—	—	FSS	1B.3	Granitic soils in mesic subalpine coniferous forests and alpine boulder and rock fields. Elevation: 8,200–9,595 feet. Blooming period: July–September	No	Species elevation range is more than 200 feet outside elevation range of Proposed Projects.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-5.** Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR <sup>11</sup>	Habitat Characteristics <sup>12</sup>	Impacts Analyzed	Rationale
<i>Lewisia serrata</i>	saw-toothed lewisia	—	—	FSS	1B.1	Mesic soils and rocky slopes in broadleaved upland, riparian, and lower montane coniferous forests. Elevation: 2,525–4,710 feet. Blooming period: May–June	Yes	Suitable habitat present.
<i>Lycopodiella inundata</i>	inundated bog club-moss	—	—	—	2B.2	Coastal bogs and fens, mesic lower montane coniferous forest, and lake margins of swamps and marshes. Elevation: 15–3,280 feet. Spring period: June–September	Yes	Suitable habitat present.





**Table C-5.** Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR <sup>11</sup>	Habitat Characteristics <sup>12</sup>	Impacts Analyzed	Rationale
<i>Meesia longiseta</i>	long seta hump moss	—	—	—	2B.3	Carbonate soils in bogs, fens, meadows, seeps, and upper montane coniferous forest. Elevation: 5,740–9,990 feet. Sporing period: unknown	Yes	Suitable habitat present.
<i>Meesia uliginosa</i>	broad-nerved hump moss	—	—	FSS	2B.2	Damp soil in bogs, fens, meadows seeps, and upper montane and subalpine coniferous forests. Elevation: 3,965–9,200 feet. Sporing period: July and October	Yes	Suitable habitat present.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-5.** Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR <sup>11</sup>	Habitat Characteristics <sup>12</sup>	Impacts Analyzed	Rationale
<i>Mertensia oblongifolia</i> var. <i>oblongifolia</i>	sagebrush bluebells	—	—	—	2B.2	Usually mesic soils in Great Basin scrub, meadows, seeps, and lower montane and subalpine coniferous forests. Elevation: 3,280–9,845 feet. Blooming period: April–July	Yes	Suitable habitat present.



**Table C-5.** Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR <sup>11</sup>	Habitat Characteristics <sup>12</sup>	Impacts Analyzed	Rationale
<i>Mielichhoferia elongata</i>	elongate copper moss	—	—	FSS	4.3	Metamorphic rock and carbonate soils, often along roadsides, that are usually vernal mesic and acidic in chaparral, meadows, seeps, coastal scrub, cismontane woodland, and broadleafed upland and lower montane and subalpine coniferous forests. Elevation: 0–6,430 feet. Spring period: unknown	Yes	Suitable habitat present.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-5.** Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR <sup>11</sup>	Habitat Characteristics <sup>12</sup>	Impacts Analyzed	Rationale
<i>Monardella follettii</i>	Follett's monardella	—	—	FSS	1B.2	Rocky and serpentine soils in lower montane coniferous forest. Elevation: 1,965–6,560 feet. Blooming period: June–September	Yes	Suitable habitat present.
<i>Nardia hiroshii</i>	Hiroshi's flapwort	—	—	—	2B.3	Damp soil with granitic bedrock. Meadows and seeps. Elevation range: Unknown. Spring period: Unknown	Yes	Suitable habitat present.



**Table C-5.** Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR <sup>11</sup>	Habitat Characteristics <sup>12</sup>	Impacts Analyzed	Rationale
<i>Oreostemma elatum</i>	tall alpine-aster	—	—	FSS	1B.2	Mesic soils in bogs, fens, meadows, seeps, and upper montane coniferous forest. Elevation: 3,295–6,890 feet. Blooming period: June–August	Yes	Suitable habitat present.
<i>Packera indecora</i>	rayless mountain ragwort	—	—	—	2B.2	Meadows and seeps. Elevation: 5,245–6,560 feet. Blooming period: July–August	Yes	Suitable habitat present.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-5.** Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR <sup>11</sup>	Habitat Characteristics <sup>12</sup>	Impacts Analyzed	Rationale
<i>Packera layneae</i>	Layne's ragwort	FT	SR	—	1B.2	Rocky serpentine or gabbro soils in chaparral and cismontane woodland. Elevation: 655–3,560 feet. Blooming period: April–August	Yes	Suitable habitat present.
<i>Peltigera gowardii</i>	veined water lichen	—	—	FSS	4.2	On rocks in cold water creeks with little to no sediment or disturbance in riparian forests. Elevation: 3,490–8,595 feet.	Yes	Suitable habitat present.



**Table C-5.** Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR <sup>11</sup>	Habitat Characteristics <sup>12</sup>	Impacts Analyzed	Rationale
<i>Penstemon personatus</i>	closed-throated beardtongue	—	—	FSS	1B.2	Metavolcanic soils in chaparral and montane coniferous forests. Elevation: 3,490–6,955 feet. Blooming period: June–October	Yes	Suitable habitat present.
<i>Phacelia stebbinsii</i>	Stebbins' phacelia	—	—	FSS	1B.2	Cismontane woodland, lower montane coniferous forest, meadows and seeps. Elevation: 2,000–6,595 feet. Blooming period: May–July	Yes	Suitable habitat present.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-5.** Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR <sup>11</sup>	Habitat Characteristics <sup>12</sup>	Impacts Analyzed	Rationale
<i>Phaeocollybia olivacea</i>	olive phaeocollybia	—	—	FSS	—	In mixed oak or pine forests primarily in coastal lowlands but also known inland. Elevation: Unknown. Spring period: September–November (Norvell 1998).	Yes	Suitable habitat present.
<i>Pinus albicaulis</i>	whitebark pine	FC	—	FSS	—	Subalpine forests. Elevation: 6,560–12,140 feet. Cone production: July–September (Jepson Flora Project 2019).	Yes	Species was found in Proposed Projects.





**Table C-5.** Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR <sup>11</sup>	Habitat Characteristics <sup>12</sup>	Impacts Analyzed	Rationale
<i>Poa sierrae</i>	Sierra blue grass	—	—	FSS	1B.3	Openings in lower montane coniferous forest. Elevation: 1,195–4,920 feet. Blooming period: April–July	Yes	Species was found in Proposed Projects.
<i>Potamogeton praelongus</i>	white-stemmed pondweed	—	—	—	2B.3	Deep water lakes associated with marshes and swamps. Elevation: 5,905–9,845 feet. July–August	Yes	Suitable habitat present.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-5.** Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR <sup>11</sup>	Habitat Characteristics <sup>12</sup>	Impacts Analyzed	Rationale
<i>Potamogeton robbinsii</i>	Robbins' pondweed	—	—	—	2B.3	Deep water lakes associated with marshes and swamps. Elevation: 5,015–10,825 feet. July–August	Yes	Suitable habitat present.
<i>Pyrrocomma lucida</i>	sticky pyrrocomma	—	—	FSS	1B.2	Alkaline clay soils in Great Basin scrub, lower montane coniferous forest, meadows, and seeps. Elevation: 2,295–6,400 feet. Blooming period: July–October	Yes	Suitable habitat present.



**Table C-5.** Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR <sup>11</sup>	Habitat Characteristics <sup>12</sup>	Impacts Analyzed	Rationale
<i>Rhamnus alnifolia</i>	alder buckthorn	—	—	—	2B.2	Meadows, seeps, and montane coniferous forest. Elevation: 4,490–6,990 feet. Blooming period: May–July	Yes	Suitable habitat present.
<i>Rhynchospora alba</i>	white beaked-rush	—	—	—	2B.2	Bogs, fens, meadows, seeps, and freshwater marshes and swamps. Elevation: 195–6,695 feet. Blooming period: June–August	Yes	Suitable habitat present.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-5.** Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR <sup>11</sup>	Habitat Characteristics <sup>12</sup>	Impacts Analyzed	Rationale
<i>Rhynchospora capitellata</i>	brownish beaked-rush	—	—	—	2B.2	Mesic soils in meadows, seeps, marshes, swamps, and montane coniferous forests. Elevation: 145–6,560 feet. Blooming period: July–August	Yes	Suitable habitat present.
<i>Schoenoplectus Schoeno-plectus subterminalis</i>	water bulrush	—	—	—	2B.3	Bogs, fens, and the montane lake margins of marshes and swamps. Elevation: 2,460–7,380 feet. Blooming period: June–September	Yes	Suitable habitat present.



**Table C-5.** Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR <sup>11</sup>	Habitat Characteristics <sup>12</sup>	Impacts Analyzed	Rationale
<i>Sidalcea stipularis</i>	Scadden Flat checkerbloom	—	SE	—	1B.1	Montane freshwater marshes and swamps. Elevation: 2,295–2,395 feet. Blooming period: July–August	No	Species elevation range is more than 200 feet outside elevation range of Proposed Projects.
<i>Sphaeralcea munroana</i>	Munro's desert mallow	—	—	—	2B.2	Great Basin scrub. Elevation: 6,560 feet. Blooming period: May–June	No	Habitat for this species is not present.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-5.** Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR <sup>11</sup>	Habitat Characteristics <sup>12</sup>	Impacts Analyzed	Rationale
<i>Streptanthus tortuosus</i> ssp. <i>truei</i>	True's mountain jewelflower	—	—	—	1B.1	Partially shaded on steep rocky slopes in lower montane coniferous forest. Elevation: 2,505–2,820 feet. Blooming period: June–July (September)	Yes	Suitable habitat present.
<i>Stuckenia filiformis</i> ssp. <i>alpina</i>	slender-leaved pondweed	—	—	—	2B.2	Shallow freshwater marshes and swamps. Elevation: 980–7,055 feet. Blooming period: May–July	Yes	Suitable habitat present.



**Table C-5.** Special-status Species Proposed Upper Drum-Spaulding Project Plants

Scientific Name	Common Name	Federal Status	State Status	Tahoe National Forest	CRPR <sup>11</sup>	Habitat Characteristics <sup>12</sup>	Impacts Analyzed	Rationale
<i>Tauschia howellii</i>	Howell's tauschia	—	—	FSS	1B.3	Granitic and gravelly soils in upper montane and subalpine coniferous forests. Elevation: 5,590–8,200 feet. Blooming period: June–August	Yes	Suitable habitat present.

**Species Status:**

Federal (USFWS and USFS): FE = Endangered, FT = Threatened, FC = Federal Candidate Species, FSS = Forest Service Sensitive, WL = Watch List

State (CDFW): SE = Endangered, ST = Threatened, SR = Rare

CRPR: 1A = Plants presumed extirpated in California and either rare or extinct elsewhere, 1B = Plants Rare, Threatened, or Endangered in California and elsewhere, 2A = Plants Presumed extirpated in California, but more common elsewhere, 2B = Plants Rare, Threatened, or Endangered in California, but more common elsewhere, 3 = Plants about which we need more information – review list, 4 = Plants of limited distribution – watch list

CRPR Threat Code Extension: None = Plants lacking any threat information, .1 = Seriously threatened in California (over 80% of occurrences threatened; high degree and immediacy of threat), .2 = Moderately threatened in California (20–80% of occurrences threatened; moderate degree and immediacy of threat), .3 = Not very threatened in California (<20% of occurrences threatened; low degree and immediacy of threat or no current threats known)

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-6.** Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Invertebrates</i>							
<i>Anodonta californiensis</i>	California floater (freshwater mussel)	—	—	FSS	Species known to occur in low elevation slow moving rivers and lakes with muddy or sandy substrates. Reproduction of mussels relies on host fish. Host species include but are not limited to: Hardhead ( <i>Mylopharodon conocephalus</i> ), Sacramento pikeminnow ( <i>Ptychocheilus grandis</i> ), threespine stickleback ( <i>Gasterosteus aculeatus</i> ), and Pit sculpin ( <i>Cottus pitensis</i> ) (Xerces 2005). Current distribution is the Lassen, Modoc, and Shasta-Trinity National Forests. Species has been reported in the Truckee River, Fall River, and Pit River within California.	No	Suitable habitat present; however, not known to occur in the Tahoe National Forest or surrounding lands (USFS 2018).





**Table C-6.** Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Bombus occidentalis</i>	western bumble bee	—	SCE	FSS	Open grassy areas, urban parks and gardens, chaparral and shrub areas, and mountain meadows. Bumble bees require flowering plants that provide adequate pollen throughout the colony's life cycle, which can vary based on elevation, but typically ranges between early February to late November. Typically nests underground in abandoned rodent burrows, such as old squirrel or other animal nests, and in open west-southwest slopes bordered by trees, although a few nests have been reported from above-ground locations such as in logs among railroad ties. Availability of nests sites may depend on rodent abundance (IUCN 2019).	Yes	Suitable habitat present.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-6.** Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Desmocerus californicus dimorphus</i>	valley elderberry longhorn beetle	FT	—	—	Dependent on host plant, elderberry ( <i>Sambucus</i> spp.), which most commonly grows in riparian woodlands, but also in some upland habitats such as oak savannas and annual grasslands. Current presumed range in Central Valley extends from Shasta County south to Fresno County, including the valley floor and lower foothills up to about 500 feet in elevation (USFWS 2017).	No	Proposed Projects are outside of known elevation range.



**Table C-6.** Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Helisoma newberryi</i>	Great Basin rams-horn	—	—	FSS	Species known on the northern edges of the Great Basin, mainly Oregon and Washington. In California, the species is known to occur in Screwdriver Creek in Shasta County and Eagle Lake in Lassen County, California. Associated with cold, larger lakes and slow-moving rivers including spring fed sources. Individuals characteristically burrow in soft mud (USFS 2010).	No	Proposed Projects are outside of known species range.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-6.** Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Juga nigrina</i>	black juga	—	—	FSS	Known in wetland habitats, seeps, springs, and slow-moving perennial waters (Taylor 1981). Species currently occurs in the Sacramento, McCloud, and Pit River systems (USFS 2018).	No	Suitable habitat present; however, not known to occur in Tahoe National Forest or surrounding lands (TNF 2018).



**Table C-6.** Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Fish</i>							
<i>Catostomas platyrhynchus</i>	mountain sucker	—	SSC	—	Individuals prefer clear streams with moderate gradients with rubble, sand, or boulder bottoms. May also be present in a variety of other water including large rivers, turbid streams, and reservoirs. Individuals have been recorded to elevations as high as ~9,186 feet (2,800 meters) and at temperatures of 1°C–28°C. In streams, usually found in pools containing aquatic macrophytes, logs, or deeply undercut banks. Spawning habitat occurs in gravelly riffles immediately upstream of deep pools. In California, native to Lahontan drainage river basins (Moyle 2002).	No	Proposed Projects are outside of native range.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-6.** Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Gila bicolor pectinifer</i>	Lahontan Lake tui chub	—	—	FSS	Large, deep lakes for schooling and algal beds in shallow, inshore areas for successful spawning, embryo hatching, and larval survival (Moyle 2002). Found in Lake Tahoe, Pyramid Lake, and in nearby Walker Lake, Nevada (Moyle et al. 1989, 1995).	No	Proposed Projects are outside of known species range.



**Table C-6.** Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Hypomesus transpacificus</i>	delta smelt	FT	SE	—	Endemic to open waters of San Francisco Bay and the Sacramento-San Joaquin River Delta. Distribution includes San Pablo Bay up through Suisun Bay, upstream through the Delta to the Sacramento River below Isleton, and the San Joaquin River below Mossdale. Spawning is thought to occur in sloughs and shallow edge-water channels in the upper Delta and in Montezuma Slough near Suisun Bay. (USFWS 2010).	No	Proposed Projects are outside of known species range.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-6.** Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Mylopharodon conocephalus</i>	hardhead	—	SSC	FSS	Small to large streams in a low to mid-elevation environments. May also inhabit lakes or reservoirs. Preferred stream temperatures might easily exceed 20°C, though these fish do not favor low dissolved oxygen levels. Usually found in clear deep streams with a slow, but present flow. Though spawning may occur in pools, runs, or riffles, the bedding area will typically be characterized by gravel and rocky substrate. Species known to occur from the Sacramento-San Joaquin and Russian River drainages from the Pit River, Modoc County, in the north, and to the Kern River, Kern County in the south (UC Davis 2017).	Yes	Suitable habitat present.





**Table C-6.** Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Oncorhynchus clarkii henshawi</i>	Lahontan cutthroat trout	FT	—	—	Generally inhabits lakes and streams. Spawning and nursery habitat characterized by cool water, pools in proximity to cover and velocity breaks, well vegetated stable stream banks, and silt free rocky substrates in riffle-run areas (USFWS 2009). In California, native to streams and lakes on the east side of the Sierras (Moyle 2002).	No	Proposed Projects are outside of known species range.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-6.** Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Oncorhynchus tshawytscha</i> ESU spring-run	Central Valley spring-run Chinook salmon	FT	ST	—	Currently found in the Sacramento-San Joaquin River Delta, the Sacramento River and its tributaries, including American, Yuba and Feather Rivers, and Mill, Deer and Butte Creeks. Numbers of adults dependent on pool depth and volume, amount of cover, and proximity to gravel. Water temperatures greater than 27°C are lethal to adults (NMFS 2016).	No	Waters associated with the Proposed Projects are not connected to anadromous waters.



**Table C-6.** Special-status Species: Proposed Upper Drum-Spaulling Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Prosopium williamsoni</i>	mountain whitefish	—	SSC	—	Most common in clear, cold streams with large pools that exceed ~3.28 feet (1 meter) in depth and in mountain lakes. In California, most of their populations are found at elevations of ~4,593–7,545 feet (1,400–2,300 meters). Spawning occurs in riffles (or wave-washed areas in lakes) in coarse gravel, cobble and rocks less than ~19.6 inches (50 centimeters) in diameter (Moyle 2002).	No	Proposed Projects are outside of known species range; species occupies stream and lakes on the east slope of the Sierra Nevada (Moyle 2002).

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-6.** Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<b>Amphibians</b>							
<i>Ambystoma macrodactylum sigillatum</i>	southern long-toed salamander	—	SSC	—	Ranges in northeast California except for the Modoc Plateau. Generally found in grasslands, dry woodlands, coniferous forests, alpine meadows, sagebrush, and intermediate habitats between those listed. Can be found in disturbed agricultural areas. At high elevations, above 6,900 feet., permanent water bodies that are deeper than 6 feet. Hardwood forests and granitic slopes are also used for upland habitat. This species strongly prefers fishless water bodies (Thomson et al. 2016).	Yes	Suitable habitat present.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)



<i>Rana boylei</i>	foothill yellow-legged frog	—	ST, SSC	FSS	<p>Ranges in the northern half of California except for the Central Valley, Modoc Plateau, and eastern side of the Sierra Nevada Mountains. Generally found in shallow flowing streams and rivers with at least cobble sized substrate. Breeding generally occurs at the margins of wide shallow channels with reduced flow variation near tributary confluences. Specifically, egg masses are placed in low flow locations on or under rocks with preferred substrates being boulders, cobbles, or gravel. Eggs have been found at depths to 87 centimeters in water velocities of 0–0.21 meters per second and at most 12.5 meters from shore. Maximum water temperature for breeding is 26°C, and 9°C to 21.5°C is the preferred range. Tadpoles avoid areas below 13°C and prefer temperatures between 16.5°C and 22.2°C (Thomson et al. 2016).</p>	Yes	Suitable habitat present.
--------------------	-----------------------------	---	---------	-----	---	-----	---------------------------

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

<i>Rana draytonii</i>	California red-legged frog	FT	SSC	—	Ponds/streams in humid forests, woodlands, grasslands, coastal scrub, and streambanks with plant cover in lowlands or foothills. Breeding habitat includes permanent or ephemeral water sources; lakes, ponds, reservoirs, slow streams, marshes, bogs, and swamps. Ephemeral wetland habitats require animal burrows or other moist refuges for estivation when the wetlands are dry. From sea level to 5,000 feet (1,525 meters). Occurs along the Coast Ranges from Mendocino County south to northern Baja California, and inland across the northernmost reaches of the Sacramento Valley and locally south through portions of the Sierra Nevada foothills as far south as northern Tulare County (Nafis 2020).	Yes	Suitable habitat present.
<i>Rana muscosa</i>	southern mountain yellow-legged frog	FE	SE	—	Lakes, ponds, meadow streams, isolated pools, and sunny riverbanks in the southern Sierra Nevada	No	Proposed Projects are outside of



**Table C-6.** Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
					Mountains. Rocky streams in narrow canyons and in the chaparral belt in the mountains of southern California. Found from 984 feet to above 12,000 feet (370–3,660 meters) in elevation (Nafis 2020).		known species range.
<i>Rana sierrae</i>	Sierra Nevada yellow-legged frog	FE	ST	FSS	Inhabits lakes, ponds, meadow streams, isolated pools, and sunny riverbanks in the Sierra Nevada mountains. Open stream and lake edges with a gentle slope up to a depth of 2–3 inches (5–8 centimeters) seem to be preferred. Waters that do not freeze to the bottom and which do not dry up are required. Known from 984–12,000 feet (298–3,626 meters) (Nafis 2020).	Yes	Suitable habitat present.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-6.** Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Reptiles</i>							
<i>Emys marmorata</i>	western pond turtle	—	SSC	FSS	Ranges throughout California except for Inyo and Mono Counties. Generally occurs in various water bodies including permanent and ephemeral systems either natural or artificial. Upland habitat that is at least moderately undisturbed is required for nesting and overwintering, in soils that are loose enough for excavation (Thomson et al. 2016).	Yes	Suitable habitat present.





**Table C-6.** Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Phrynosoma balinvilli</i>	coast horned lizard	—	SSC	—	The species is known to occur in valley-foothill hardwood, riparian, and conifer habitats, and occasionally grasslands. They range from the Sierra Nevada foothills and throughout the central California coast. Individuals utilize loose soils for burrowing, forage in open areas or between shrubs, and do not require permanent water (CDFW 2020c).	Yes	Suitable habitat present.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-6.** Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<b>Birds</b>							
<i>Accipiter gentilis</i>	northern goshawk	—	SSC	FSS	Mature and old-growth forests including Ponderosa pine ( <i>Pinus ponderosa</i> ), Jeffrey pine ( <i>Pinus jeffreyi</i> ), Lodgepole pine ( <i>Pinus contorta</i> ), mixed conifer, Douglas-fir ( <i>Pseudotsuga menziesii</i> ), mixed Redwood-Douglas-fir hardwood, and quaking aspen ( <i>Populus tremuloides</i> ). Occurs in North Coast Ranges through Sierra Nevada, Klamath, Cascade, and Warner Mountains, in Mount Pinos and San Jacinto, San Bernardino, and White Mountains (Shuford and Gardali 2008).	Yes	Suitable habitat present.



**Table C-6.** Special-status Species: Proposed Upper Drum-Spauling Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Antigone canadensis tabida</i>	greater sandhill crane	—	ST, FP	FSS	Breeds in and near wet meadow, shallow lacustrine, and fresh emergent wetland habitats. Winters in annual and perennial grassland habitats, moist croplands with rice or corn stubble, and open, emergent wetlands. Prefers treeless plains. Nests in remote portions of extensive wetlands or sometimes shortgrass prairies. In California, breeds only in Siskiyou, Modoc, and Lassen Counties, and in Sierra Valley in Plumas and Sierra Counties. Winters primarily in the Sacramento and San Joaquin Valleys from Tehama County south to Kings County (CDFW 2020c).	No	Proposed Projects are outside of species nesting and wintering range (CDFW 2020a).

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-6.** Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Aquila chrysaetos</i>	golden eagle	BGEPA	FP	—	Habitat includes rolling foothills and mountain terrain, wide arid plateaus deeply cut by streams and canyons, open mountain slopes, and cliffs and rock outcrops. Uncommon resident in hills and mountains throughout California, and an uncommon migrant and winter resident in the Central Valley and Mojave Desert (CDFW 2020c).	Yes	Suitable habitat present.
<i>Contopus cooperi</i>	olive-sided flycatcher	—	SSC	—	Nests in a wide variety of forest and woodland habitats below 9,000 feet in the coastal and mountainous portions of the state (occurs only as a migrant elsewhere). Prefers forests and woodlands with adjacent meadows, lakes or open terrain for foraging. (CDFW 2020c).	Yes	Suitable habitat present.



**Table C-6.** Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Cypseloides niger</i>	black swift	—	SSC	—	Breeding sites are very specific: behind or beside permanent or semi-permanent waterfalls, on perpendicular cliffs near water and in sea caves. Breeds very locally in the Sierra Nevada and Cascade Range, the San Gabriel, San Bernardino, and San Jacinto Mountains, and in coastal bluffs and mountains from San Mateo County south to San Luis Obispo County (Shuford and Gardali 2008).	Yes	Suitable habitat present.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-6.** Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Empidonax traillii</i>	willow flycatcher	—	SE	FSS	Summer resident in wet meadows and montane riparian habitats from 2,000–8,000 feet elevation in the Sierra Nevada and Cascade Ranges. Most often found in open river valleys or large mountain meadows with lush shrubby willows. Has been observed breeding along the Santa Ynez River in Santa Barbara County, and along the Santa Clara River in Ventura County (CDFW 2020c).	Yes	Suitable habitat present.



**Table C-6.** Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Haliaeetus leucocephalus</i>	bald eagle	BGEPA	SE, FP	FSS	Nests in large, old-growth, or dominant live tree with open branchwork, especially ponderosa pine. Requires large bodies of water or rivers with abundant fish, and adjacent snags. Permanent resident, and uncommon winter migrant, now restricted to breeding mostly in Butte, Lake, Lassen, Modoc, Plumas, Shasta, Siskiyou, and Trinity Counties. About half of the wintering population is in the Klamath Basin (CDFW 2020c).	Yes	Suitable habitat present.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-6.** Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Histrionicus histrionicus</i>	harlequin duck	—	SSC	—	Historically nested along rivers on the west slope of the central Sierra Nevada and wintered on the coast. They are observed very infrequently within their historic range but may be extirpated from the Yosemite region. They inhabit turbulent mountain rivers. They prefer streams with low acidity, steep banks, instream rocks and islands for roosting and nesting, and relatively high vegetative cover on stream banks (Shuford and Gardali 2008).	Yes	Suitable habitat present.





**Table C-6.** Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Lanius ludovicianus</i>	loggerhead shrike	—	SSC	—	Breed in shrublands or open woodlands with a fair amount of grass cover and areas of bare ground (Shuford and Gardali 2008).	No	Species has potential to occur in migration or non-breeding season, but Proposed Projects are outside nesting range of species (CDFW 2020) <sup>13</sup> .

<sup>13</sup> Only nesting loggerhead shrikes protected (CDFW 2020d)

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-6.** Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Laterallus jamaicensis coturniculus</i>	California black rail	—	ST, FP	—	Saline, brackish, and fresh emergent wetlands. Scarce, but true abundance difficult to determine due to small size and extremely secretive nature. Known to nest at scattered locations in the San Francisco Bay Area and Delta region, Point Reyes National Seashore, San Luis Obispo and Orange Counties, as well as the Imperial and Lower Colorado River Valleys. Appears intermittently and sparingly at a few locations in the Sacramento Valley (CDFW 2020c).	No	Suitable habitat not present.



**Table C-6.** Special-status Species: Proposed Upper Drum-Spauling Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Setophaga petechia</i>	yellow warbler	—	SSC	—	Usually found in riparian deciduous habitats in summer: cottonwoods ( <i>Populus</i> spp.), willows ( <i>Salix</i> spp.), alders ( <i>Alnus</i> spp.), and other small trees and shrubs typical of low, open-canopy riparian woodland. Also breeds in montane shrubbery in open conifer forests (CDFW 2020c).	Yes	Suitable habitat present.
<i>Strix nebulosa</i>	great gray owl	—	SE	FSS	Breeds in red fir, mixed conifer, or lodgepole pine habitats, always near wet meadows. Nests in large, broken-topped snags usually 25–72 feet (8–23 meters) above the ground. A rarely seen resident at 4,500–7,500 feet (1,400–2,300 meters) in the Sierra Nevada from the vicinity of Quincy, Plumas Counties south to the Yosemite region (CDFW 2020c).	Yes	Suitable habitat present.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-6.** Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Strix occidentalis occidentalis</i>	California spotted owl	—	SSC	FSS	Older forests in areas of high canopy cover, with a multi-layered canopy, old decadent trees, a high number of large trees, and coarse downed woody debris. In California, ranges throughout the west slopes of the Sierra Nevada Mountains, and down the Coast Range Mountains from Carmel south through the Transverse Ranges nearly to Baja California (Shuford and Gardali 2008).	Yes	Suitable habitat present.



**Table C-6.** Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<b>Mammals</b>							
<i>Antrozous pallidus</i>	pallid bat	—	SSC	FSS	Ranges across all of California except for high elevation portions of the Sierra Nevada Mountains and Del Norte, western Siskiyou, Humboldt, and northern Mendocino Counties. Generally found in a wide variety of habitats but with some preference for drier areas. Day roosts are in caves, crevices, mines, and occasionally in hollow trees and buildings (CDFW 2020c).	Yes	Suitable habitat present.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-6.** Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Aplodontia rufa californica</i>	Sierra Nevada mountain beaver	—	SSC	—	Ranges in the Cascade, Klamath, and Sierra Nevada Mountains. Generally found in dense riparian forests and open shrubscapes around most forests. Specifically found with open to moderate canopy cover with a dense understory near water. This species requires deep friable soils and a cool moist microclimate (CDFW 2020c).	Yes	Suitable habitat present.



**Table C-6.** Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Canis lupis</i>	gray wolf	FE	SE	—	Habitat preferences appear to be more prey dependent than cover dependent. Territories have a variety of topographic features. Forests, open meadows, rocky ridges, and lakes or rivers all comprise a pack's territory. In the west, gray wolves have been known to follow the seasonal elevational movements of ungulate herds (Snyder 1991). Wolf packs in northern California, including the northern Sierras near Lassen have been documented in the last few years (CDFW 2020c).	Yes	Recent documentation of an individual gray wolf in Tahoe National Forest and a pack in the northern Sierras. Species may be found in areas associated with the Proposed Projects in the future (CDFW 2020).

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-6.** Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Corynorhinus townsendii</i>	Townsend's big-eared bat	—	SSC	FSS	Ranges throughout California except for high elevation portions of the Sierra Nevada Mountains. Generally prefers mesic habitats but known to occur in all non-alpine habitats of California. Roosting occurs in caves, tunnels, mines, buildings, or other structures and this species may use different roosting sites for day and night (CDFW 2020c).	Yes	Suitable habitat present.





**Table C-6.** Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Euderma maculatum</i>	spotted bat	—	SSC	—	Ranges along the eastern half of California as well as all of southern California except for Orange County and southern Los Angeles County. Generally occurs in desert, mixed conifer, and grassland habitats. Specifically, this species prefers to roost in rock crevices on cliffs but will sometimes use caves and buildings (CDFW 2020c).	Yes	Suitable habitat present.
<i>Gulo gulo</i>	California wolverine	FCT	ST, FP	FSS	Mixed conifer, red fir ( <i>Abies magnifica</i> ), and lodgepole habitat. Probably associated with subalpine conifer, alpine dwarf-shrub, wet meadow, and montane riparian habitats between 4,300–7,300 feet (1,311–2,225 meters) (CDFW 2020c).	Yes	Suitable habitat present.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-6.** Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Lepus americanus tahoensis</i>	Sierra Nevada snowshoe hare	—	SSC	—	Ranges in the Northern Sierra Nevada range and the Cascade, Warner, and Klamath Mountains. Generally occurs in montane riparian habitats. Specifically occurs in areas with a dense understory of typically chaparral and mature alders and willows with some presence of young coniferous trees (CDFW 2020c).	Yes	Suitable habitat present.
<i>Martes caurina sierrae</i>	Sierra marten	—	—	FSS	Species is uncommon in the Sierra Nevada Range. Preferred habitat includes mixed evergreen forests with large trees and snags within mixed conifer, Jeffrey pine, and lodgepole pine habitats. Species prefers areas with minimal human influence and disturbance (CDFW 2020c).	Yes	Suitable habitat present.



**Table C-6.** Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Myotis thysanodes</i>	fringed myotis	—	—	FSS	Widespread in California, occurring in all but the Central Valley and Colorado and Mojave Deserts. It occurs in a wide variety of habitats; records range in elevation from sea level to 9,350 feet (2,850 meters) in New Mexico (Barbour and Davis 1969). Optimal habitats are pinyon-juniper, valley foothill hardwood and hardwood-conifer, generally at 4,000–7,000 feet (1,300–2,200 meters) (CDFW 2020c).	Yes	Suitable habitat present.
<i>Pekania pennanti</i>	fisher	—	SSC	FSS	Large areas of mature, dense forest stands with snags and greater than 50% canopy closure. Uncommon permanent resident of the Sierra Nevada, Cascades, and Klamath Mountains; also found in a few areas in the North Coast Ranges (USFWS 2014).	Yes	Suitable habitat present.

Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
 and Lower Drum Hydroelectric Project (FERC No. 14531)

**Table C-6.** Special-status Species: Proposed Upper Drum-Spaulding Project Wildlife

Scientific Name	Common Name	USFWS	CDFW	Tahoe National Forest	Habitat Characteristics	Impacts Analyzed?	Rationale
<i>Taxidea taxus</i>	American badger	—	SSC	—	Ranges in all of California except the extreme northwest corner. Generally found in drier open areas of habitats with friable soils (CDFW 2020c).	Yes	Suitable habitat present.
<i>Vulpes vulpes necator</i>	Sierra Nevada red fox	FC	ST	FSS	Found in a variety of habitats, including alpine dwarf-shrub, wet meadow, subalpine conifer, lodgepole pine, red fir, aspen, montane chaparral, montane riparian, mixed conifer, Jeffrey pine, eastside pine, montane hardwood-conifer, and ponderosa pine. Most sightings above 7,000 feet (2,134 meters), ranging from 3,900–11,900 feet (1,189–3,627 meters). Dens in rocky outcrops, hollow logs and stumps, and burrows in friable soil (CDFW 2020c).	Yes	Suitable habitat present.

Sources: California Department of Fish and Wildlife, November 2018, Special Animals List, <https://www.wildlife.ca.gov/Data/CNDDDB/Plants-and-Animals>, CDFW Biogeographic Data Branch, Sacramento.

Notes: USFWS = U.S. Fish and Wildlife Service; CDFW = California Department of Fish and Wildlife; DPS = Distinct

Appendix C Biological Resources Information  
PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
and Lower Drum Hydroelectric Project (FERC No. 14531)



Population Segment

Species Status:

Federal (USFWS and USFS): BGEPA = Bald and Golden Eagle Protection Act, FE = Endangered, FT = Threatened, FCE = Candidate Endangered, FCT = Candidate Threatened, FCD = Candidate for delisting, BLMS = BLM Sensitive, FSS = Forest Service Sensitive

State (CDFW): SE = Endangered, ST = Threatened, SCE = Candidate Endangered, SCT = Candidate Threatened, SCD = Candidate for delisting, FP = Fully Protected, SSC = Species of Special Concern

## 8. References

- Audubon Society. 2020. "Barrow's Goldeneye Life History."  
<https://www.audubon.org/field-guide/bird/barrows-goldeneye>.
- Barbour, R. W., and W. H. Davis. 1969. *Bats of America*. Univ. of Kentucky Press, Lexington. 286pp.
- Bates, C. 2006. "Burrowing Owl (*Athene cunicularia*).” In *The Draft Desert Bird Conservation Plan: A Strategy for Reversing the Decline of Desert-associated Birds in California*. California Partners in Flight.  
<http://www.prbo.org/calpif/htmldocs/desert.html>.
- California Department of Fish and Wildlife (CDFW). 2015. "Fish Species of Special Concern Accounts, 3rd Edition."  
<https://www.wildlife.ca.gov/Conservation/SSC/Fishes>.
- . 2020a. "California Natural Diversity Database BIOS 5 Viewer." CDFW Biogeographic Data Branch, Sacramento, California.  
<http://www.dfg.ca.gov/biogeodata/cwhr/cawildlife.aspx>.
- . 2020b. "California Wildlife Habitat Relationship System." CDFW Biogeographic Data Branch, Sacramento, California.  
<https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=67412&inline>.
- . 2020c. "Life History Accounts and Range Maps Database."  
<https://wildlife.ca.gov/Data/CWHR/Life-History-and-Range>.
- . 2020d. "Special Animals List – November 2020."
- California Native Plant Society (CNPS). 2020. "Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39)." CNPS, Sacramento, California.  
<http://www.rareplants.cnps.org>.
- Cornell. 2019. "White-tailed Kite Life History."  
[https://www.allaboutbirds.org/guide/White-tailed\\_Kite/lifehistory](https://www.allaboutbirds.org/guide/White-tailed_Kite/lifehistory).
- Faber-Langendoen, D., L. Master, J. Nichols, K. Snow, A. Tomaino, R. Bittman, G. Hammerson, B. Heidel, L. Ramsay, and B. Young. 2012. "NatureServe Conservation Status Assessments: Methodology for Assigning Ranks" (Revised Edition). June. Arlington, Virginia: NatureServe.  
<https://www.natureserve.org/biodiversity-science/publications/natureserve-conservation-status-assessments-methodology-assigning>.
- Federal Energy Regulatory Commission (FERC). 2014. *Final Environmental Impact Statement for Hydropower License*.
- Google Earth Pro. 2020. *Imagery Date Range 1993–2019*.



- Hamilton, W. J. 2004. "Tricolored Blackbird (*Agelaius tricolor*)." In *The Riparian Bird Conservation Plan: A Strategy for Reversing the Decline of Riparian-associated Birds in California*. California Partners in Flight.
- International Union for Conservation of Nature (IUCN). 2019. "The IUCN Red List of Threatened Species 2015: e.T44937492A46440201." <http://dx.doi.org/10.2305/IUCN.UK.2015-2.RLTS.T44937492A46440201.en>.
- Jepson Flora Project. 2019 (December 20, Revision 7). "Jepson eFlora." Berkeley, CA: The Jepson Herbarium. <http://ucjeps.berkeley.edu/eflora/>.
- Moyle, P. B. 2002. *Inland Fishes of California*. Revised and expanded. University of California Press, Berkeley.
- Moyle, P. B., J. E. Williams, and E. D. Wikramanayoke. 1989. *Fish Species of Special Concern of California*. California Department of Fish and Game. Rancho Cordova, CA.
- Moyle, P. B., P. J. Randall, R. Nichols, R. M. Yoshiyama, and R. A. Knapp. 1997. "Status of Fish and Fisheries." In *Status of the Sierra Nevada – The Sierra Nevada Ecosystem Project*, Volume II. Don C. Erman, general editor, and the SNEP Team, 953–973. U.S. Geological Survey Digital Data Series DDS-43.
- Moyle, P. B., R. M. Yoshiyama, J. E. Williams, and E. D. Wikramanayake. 1995. *Fish Species of Special Concern in California*. California Department of Fish and Game. Second Edition. Rancho Cordova, CA.
- MykoWeb. 2020. [https://www.mykoweb.com/boletes/species/Boletus\\_erythropus.html](https://www.mykoweb.com/boletes/species/Boletus_erythropus.html)
- Nafis, Gary. 2020. "California Herps: A Guide to Reptiles and Amphibians of California." <http://www.californiaherps.com/>.
- National Marine Fisheries Service (NMFS). 2014. *Final Biological Opinion on the U.S. Army Corps of Engineers' Operation and Maintenance of Daguerre Point Dam on the Yuba River*. May 12.
- . 2016. *5-Year Review: Summary and Evaluation of Central Valley Spring-run Chinook Salmon ESU*. NMFS; Long Beach, CA.
- . 2020. "National Marine Fisheries Service, West Coast Region, California Species List Tools." [https://www.westcoast.fisheries.noaa.gov/maps\\_data/california\\_species\\_list\\_tools.html](https://www.westcoast.fisheries.noaa.gov/maps_data/california_species_list_tools.html).
- National Oceanic and Atmospheric Administration (NOAA). 2019. NOAA Fisheries, West Coast Region, Protected Species Accounts. Available online: [https://archive.fisheries.noaa.gov/wcr/protected\\_species/salmon\\_steelhead/salmon\\_and\\_steelhead\\_listings/steelhead/california\\_central\\_valley/california\\_central\\_valley\\_steelhead.html](https://archive.fisheries.noaa.gov/wcr/protected_species/salmon_steelhead/salmon_and_steelhead_listings/steelhead/california_central_valley/california_central_valley_steelhead.html)
- Nevada Irrigation District (NID). 2008. *Relicensing Pre-Application Document for Yuba-Bear Hydroelectric Project, FERC No. 2266*. April.

## Appendix C Biological Resources Information

PG&E's Upper Drum-Spaulding Hydroelectric Project (FERC No. 2310)  
and Lower Drum Hydroelectric Project (FERC No. 14531)

- Norvell, L.L. 1998. The biology and taxonomy of Pacific Northwest species of *Phaeocollybia* Heim (Agaricales, Cortinariaceae). Seattle, WA: University of Washington. 391 p. Ph.D. dissertation.
- Pacific Gas and Electric Company (PG&E). 2011. "Application for New License, Dum-Spaulding Project FERC Project No. 2310-173." Accessed February 28, 2020. <http://www.eurekasw.com/DS/Final%20License%20Application/Forms/AllItems.aspx>
- Shuford, W. D., and Gardali, T., Editors. 2008. *California Bird Species of Special Concern: A Ranked Assessment of Species, Subspecies, and Distinct Populations of Birds of Immediate Conservation Concern in California*. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento.
- Snyder, S. A. 1991. "*Canis lupus*." In *Fire Effects Information System* [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). <http://www.fs.fed.us/database/feis/animals/mammal/cal/ai>.
- Taylor, D. W. 1981. *Freshwater Mollusks of California: A Distributional Checklist*. California Fish and Game. 67(3): 140–163.
- Thomson, Robert C., Wright, Amber N., and Shaffer H. Bradley. 2016. *California Amphibian and Reptile Species of Special Concern*. University of California Press, Berkeley, CA.
- UC Davis PISCES: Center for Watershed Sciences. 2017. *Hardhead (Mylopharodon conocephalus)*. Available online: <https://pisces.ucdavis.edu/content/mylopharodon-conocephalus>
- U.S. Fish and Wildlife Service (USFWS). 2007. *Vernal Pool Fairy Shrimp (Branchinecta lynchi) 5-Year Review: Summary and Evaluation*. USFWS; Sacramento, CA.
- . 2009. *Lahontan Cutthroat Trout (Oncorhynchus clarki henshawi) 5-Year Review: Summary and Evaluation*. USFWS; Reno, Nevada.
- . 2010. *Endangered and Threatened Wildlife and Plants; 12-Month Finding on a Petition to Reclassify the Delta Smelt from Threatened to Endangered throughout its Range*. USFWS, Sacramento, CA.
- . 2012. *Giant Garter Snake (Thamnophis gigas) 5-Year Review: Summary and Evaluation*. USFWS; Sacramento, CA.
- . 2020. "Critical Habitat Mapper." <https://fws.maps.arcgis.com/home/webmap/viewer.html>.
- U.S. Forest Service (USFS). 2004. *Sierra Nevada Forest Plan Amendment*.
- . 2010. "Species Fact Sheet Great Basin Rams-horn." <https://www.fs.fed.us/r6/sfpnw/issssp/documents/planning-docs/sfs-ig-helisoma-newberryi-2010-05.doc>.





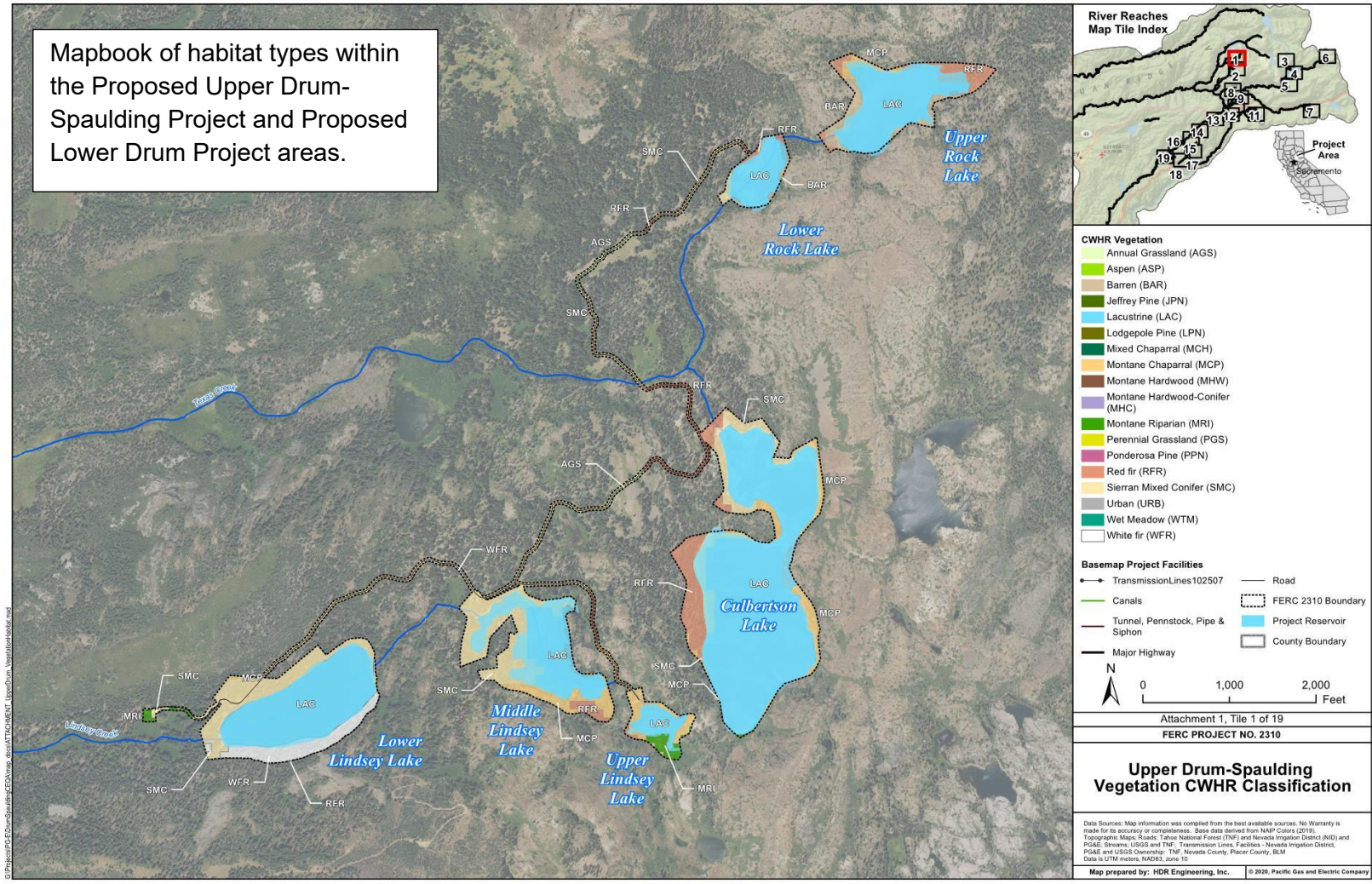
- . 2013a. *Region 5 Regional Forester's Sensitive Animal Species List*.
  - . 2013b. *Region 5 Regional Forester's Sensitive Plant Species List*.
  - . 2014. *Draft. Species Report: Fisher (Pekania pennanti), West Coast Population*. USFWS, Sacramento, CA.
  - . 2017. *Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle (Desmocerus californicus dimorphus)*. USFWS, Sacramento, CA.
  - . 2018. *Biological Evaluation/Biological Assessment for Terrestrial and Aquatic Wildlife Yuba Project*. Yuba River Ranger District Tahoe National Forest. Revised January 19, 2018.
- Xerces Society for Invertebrate Conservation (Xerces). 2005. "Anodonta californiensis (Lea, 1852) / Anodonta nuttalliana (Lea, 1838) California Floater / Winged Floater Bivalvia: Unionidae." <http://xerces.org/sites/default/files/publications/10-029.pdf>.

**Attachment 1**

*This page is intentionally blank*

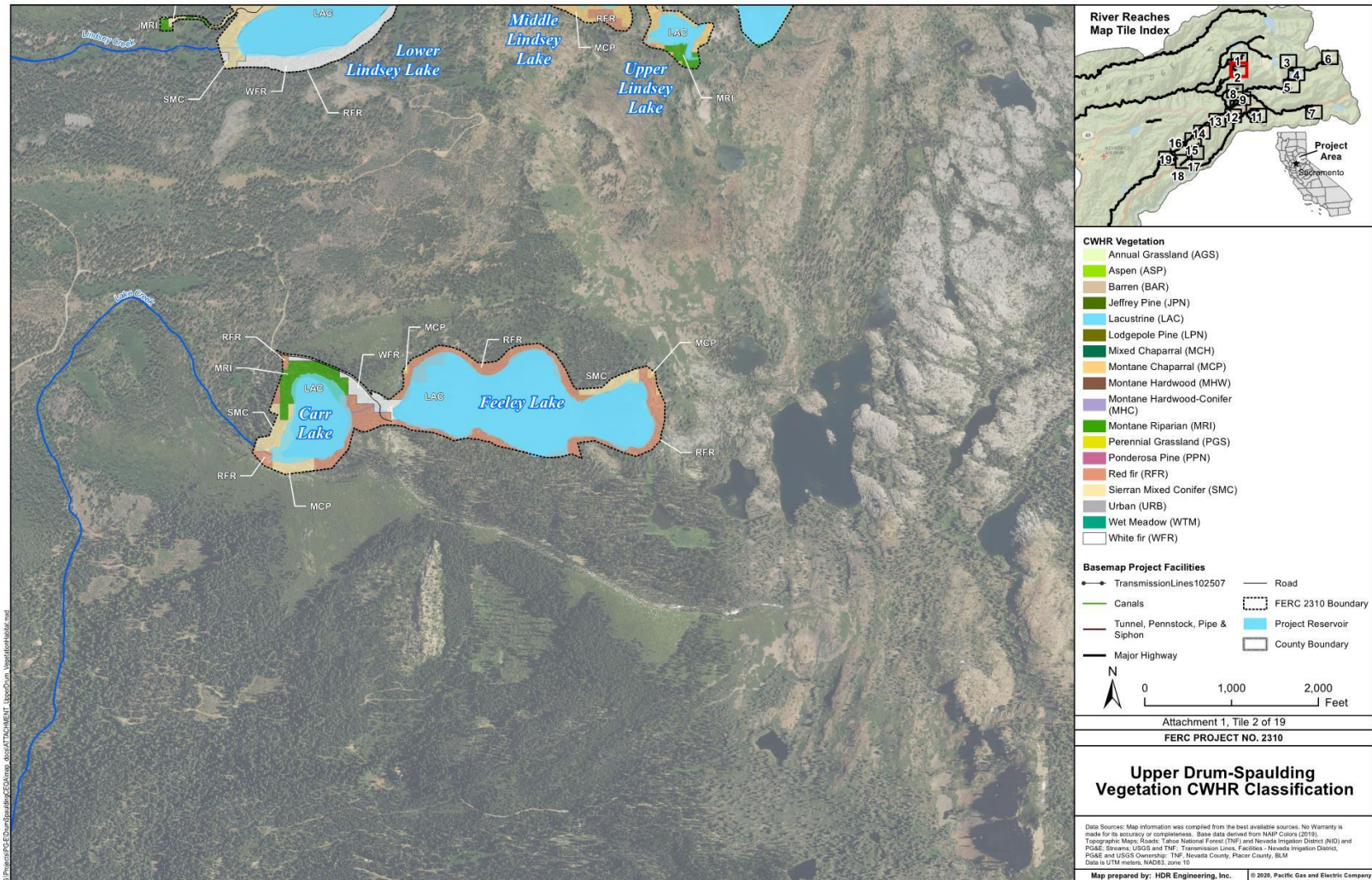
Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Facilities (FERC No. 2310)  
 and Lower Drum Hydroelectric Facilities (FERC No. 14531)

Mapbook of habitat types within the Proposed Upper Drum-Spaulding Project and Proposed Lower Drum Project areas.



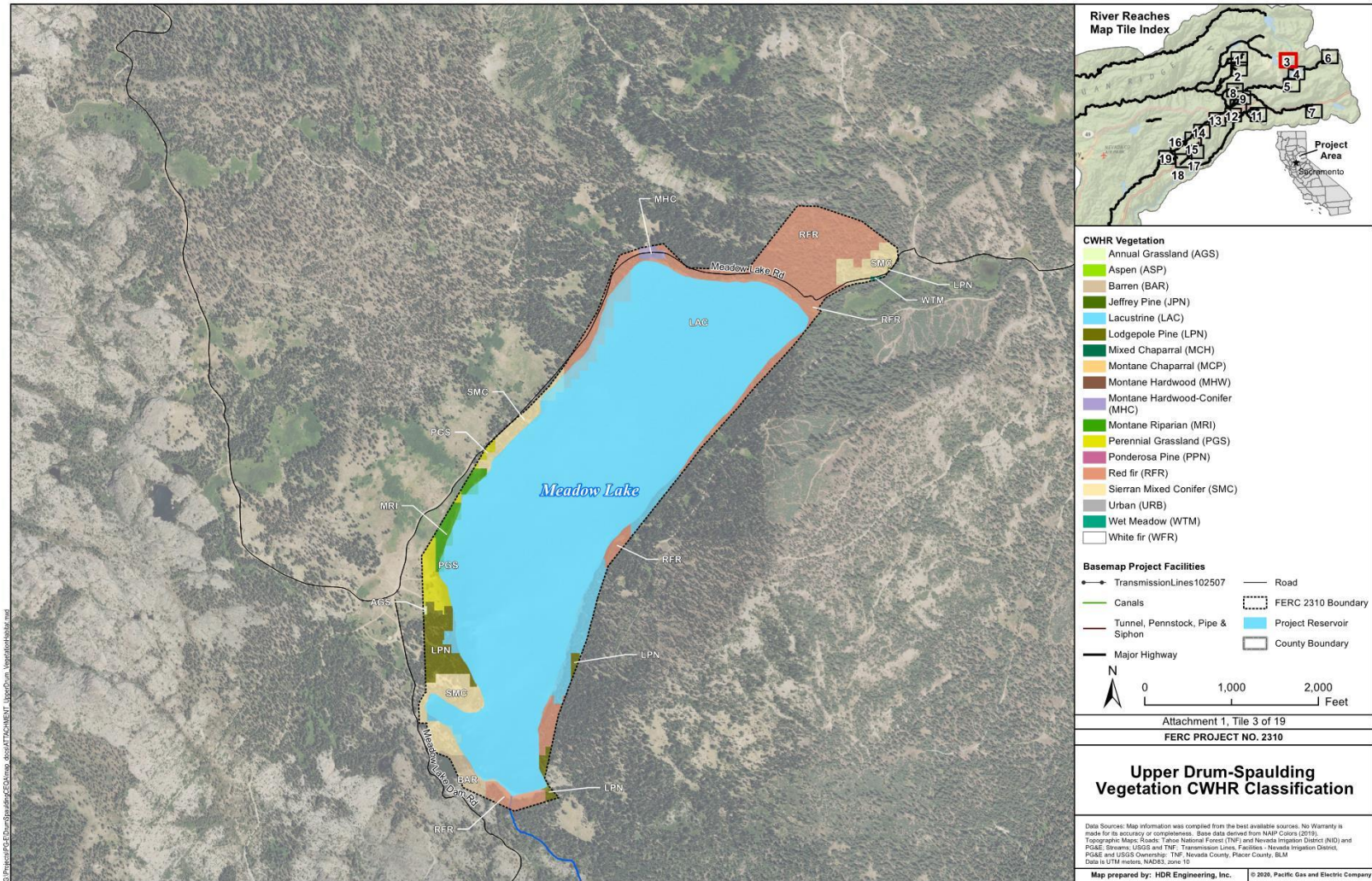


# Appendix C Biological Resources Information PG&E's Upper Drum-Spaulding Hydroelectric Facilities (FERC No. 2310) and Lower Drum Hydroelectric Facilities (FERC No. 14531)



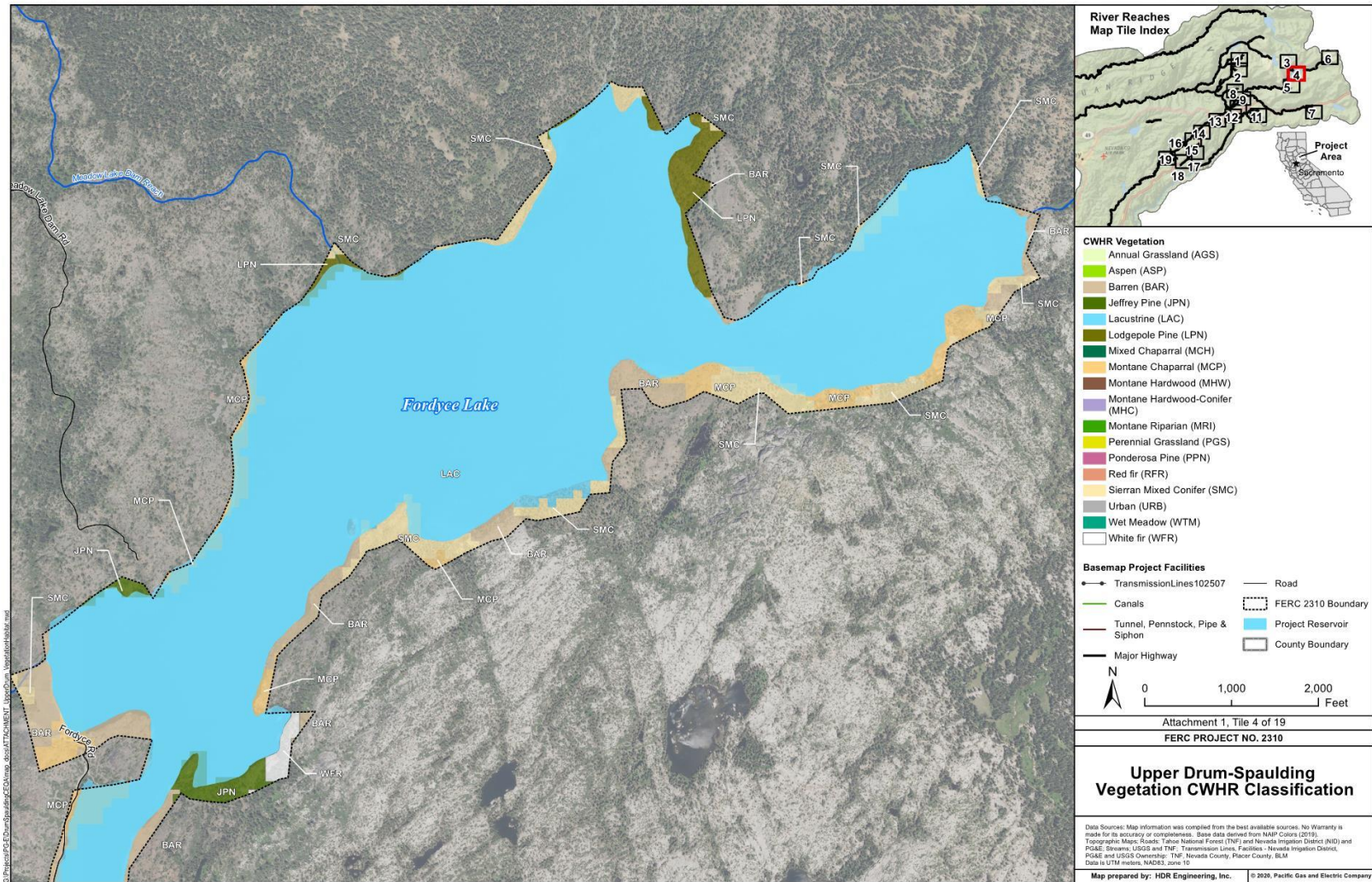


Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Facilities (FERC No. 2310)  
 and Lower Drum Hydroelectric Facilities (FERC No. 14531)



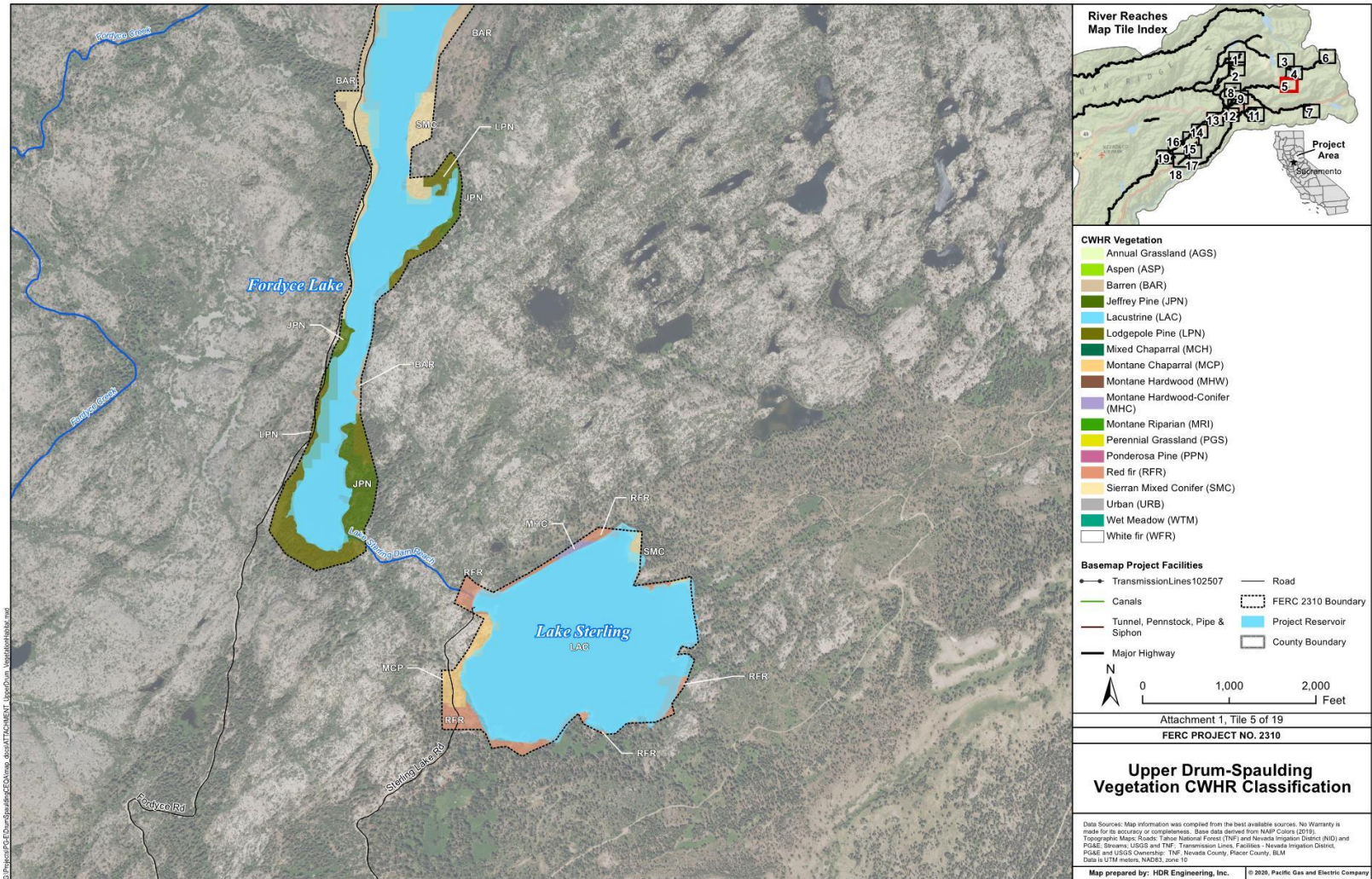


# Appendix C Biological Resources Information PG&E's Upper Drum-Spaulding Hydroelectric Facilities (FERC No. 2310) and Lower Drum Hydroelectric Facilities (FERC No. 14531)



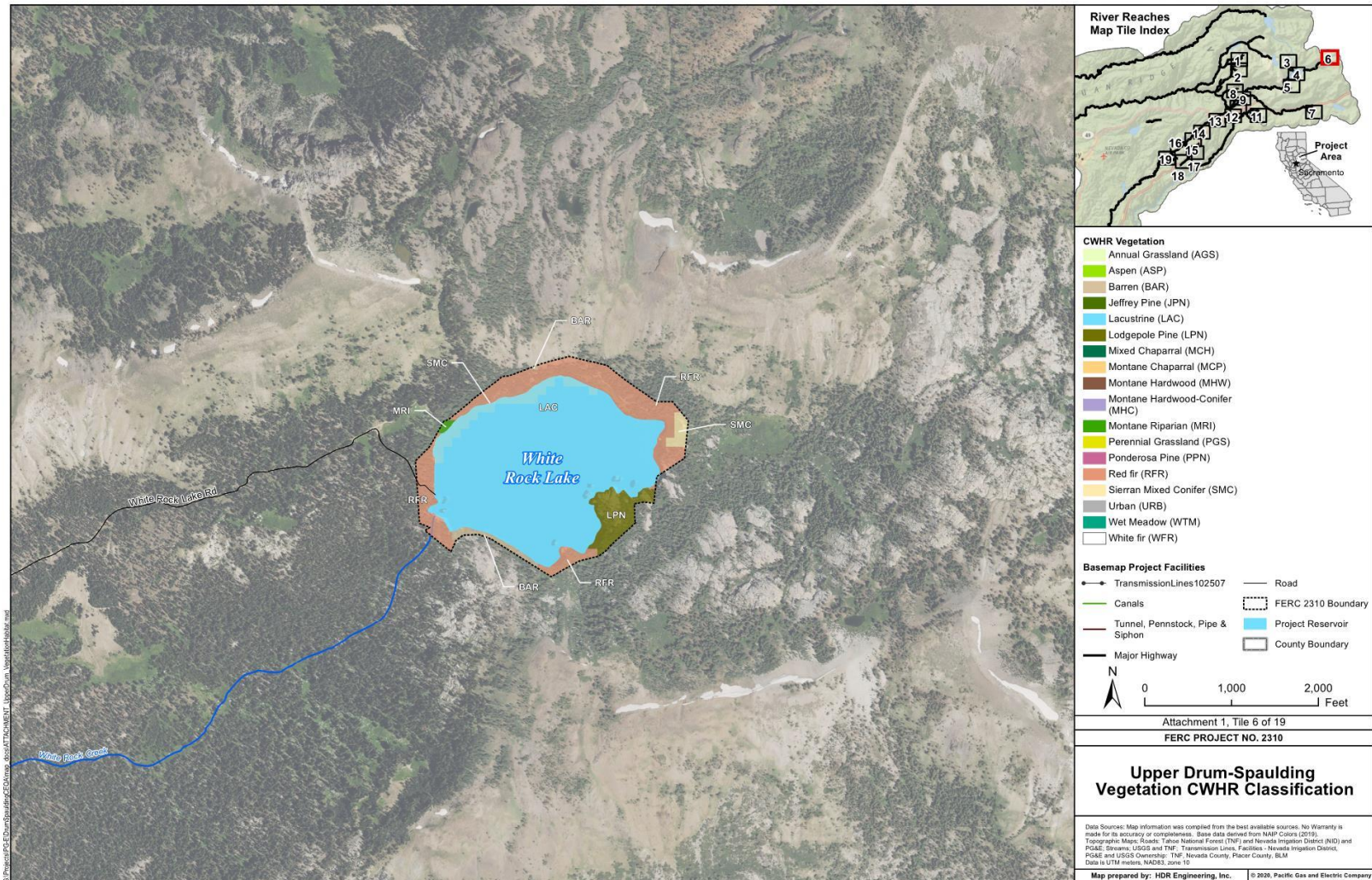


Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Facilities (FERC No. 2310)  
 and Lower Drum Hydroelectric Facilities (FERC No. 14531)



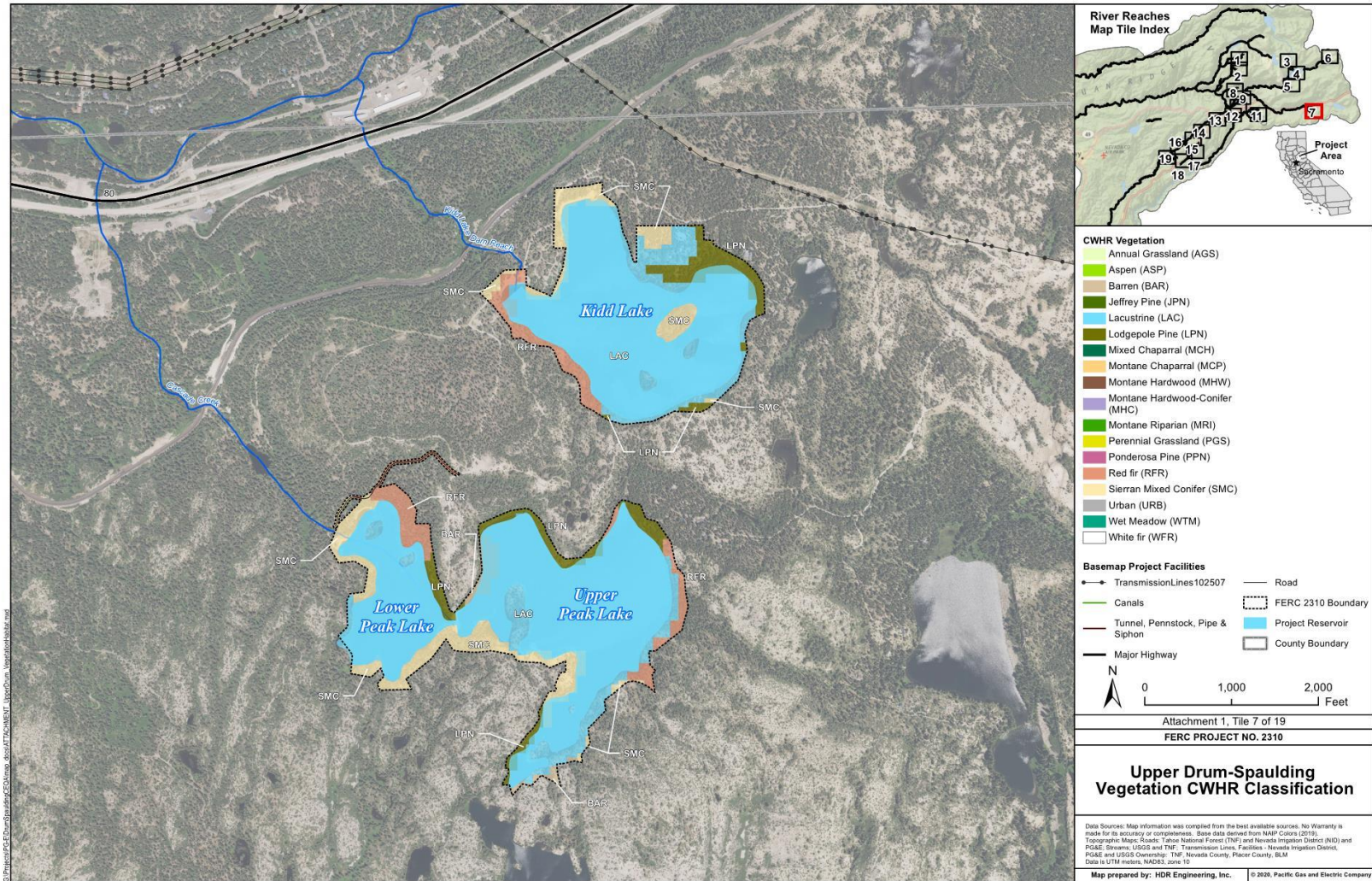


# Appendix C Biological Resources Information PG&E's Upper Drum-Spaulding Hydroelectric Facilities (FERC No. 2310) and Lower Drum Hydroelectric Facilities (FERC No. 14531)



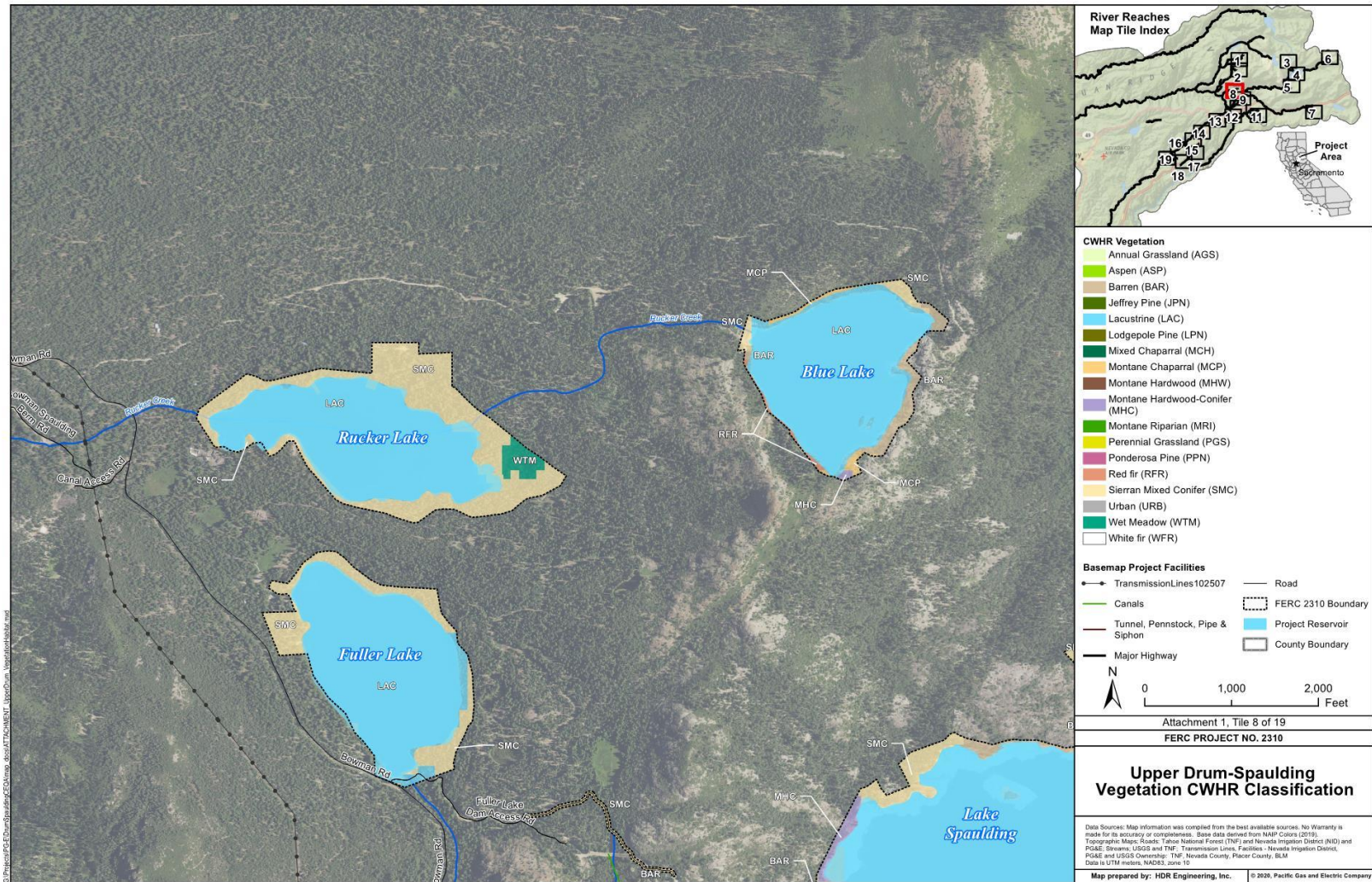


Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Facilities (FERC No. 2310)  
 and Lower Drum Hydroelectric Facilities (FERC No. 14531)





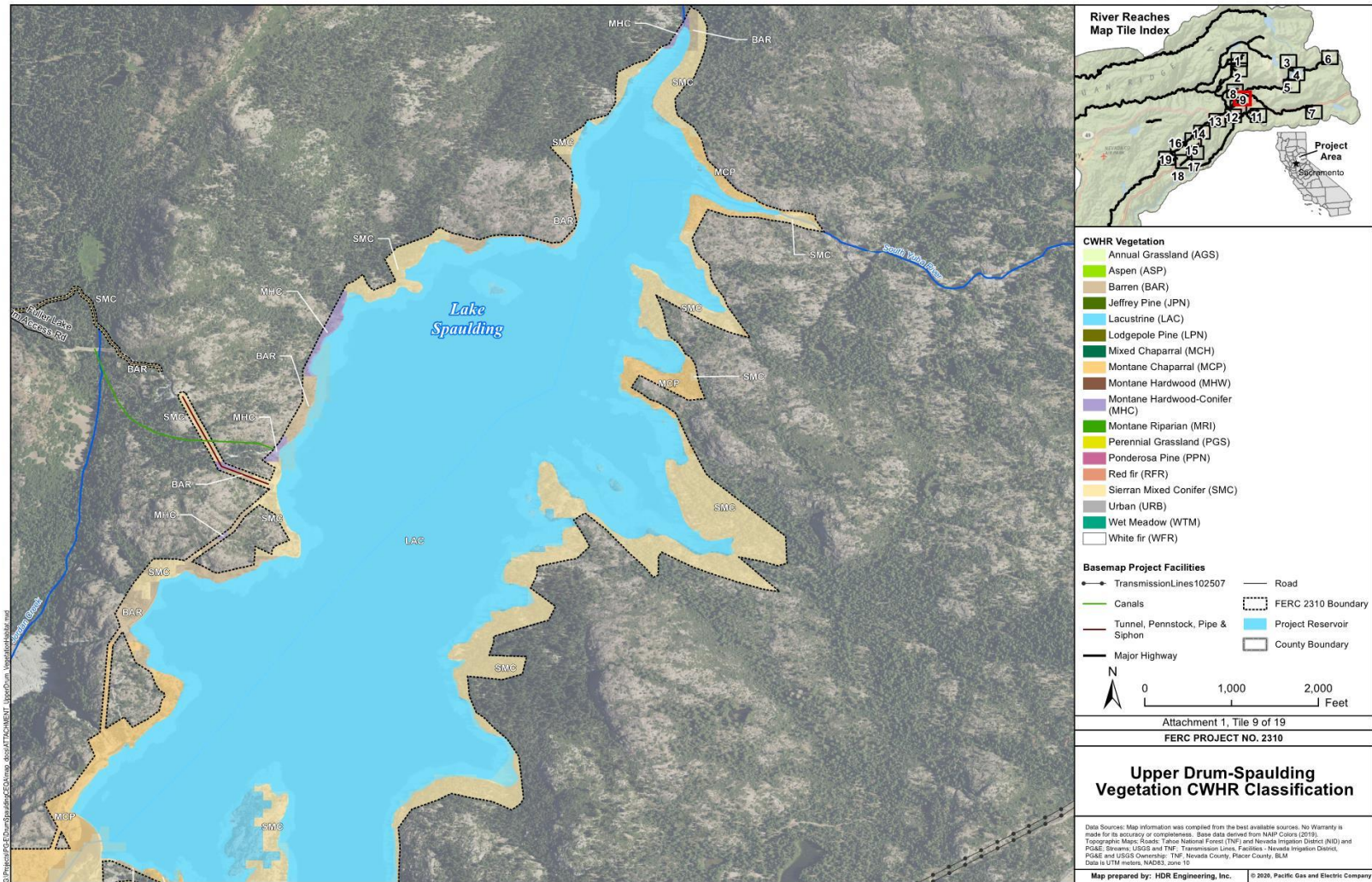
# Appendix C Biological Resources Information PG&E's Upper Drum-Spaulding Hydroelectric Facilities (FERC No. 2310) and Lower Drum Hydroelectric Facilities (FERC No. 14531)





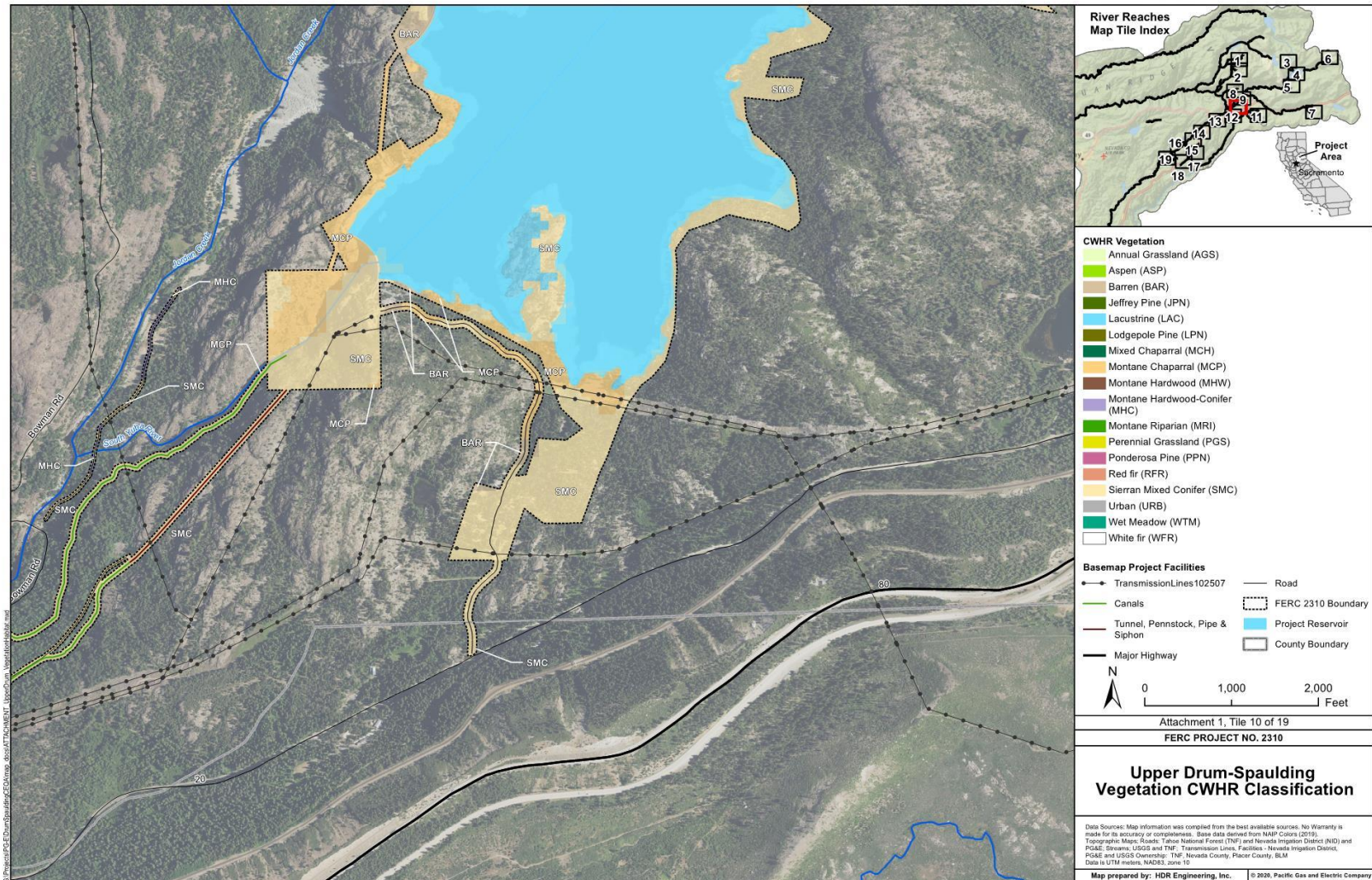
# Appendix C Biological Resources Information

## PG&E's Upper Drum-Spaulding Hydroelectric Facilities (FERC No. 2310) and Lower Drum Hydroelectric Facilities (FERC No. 14531)



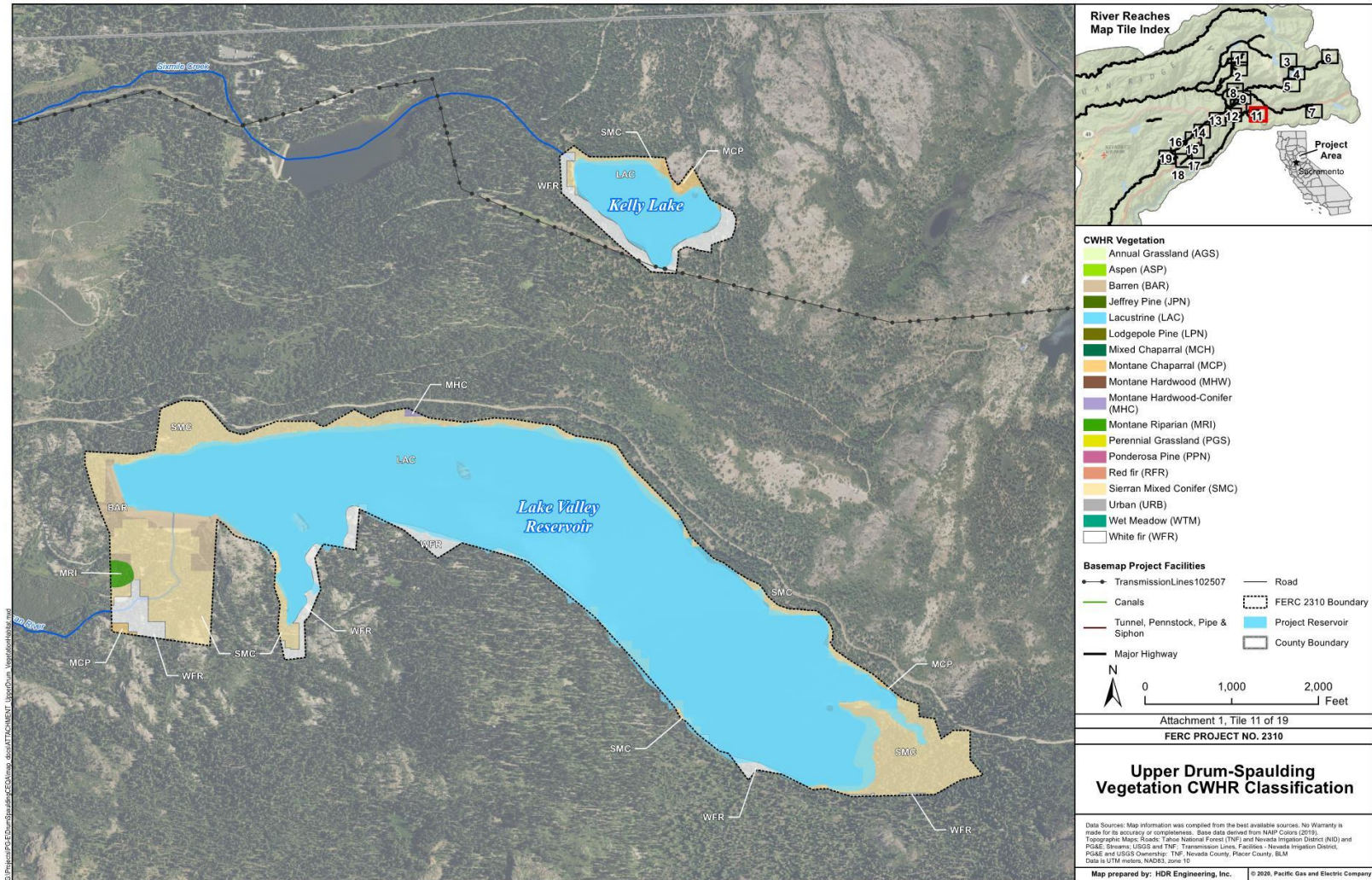


# Appendix C Biological Resources Information PG&E's Upper Drum-Spaulding Hydroelectric Facilities (FERC No. 2310) and Lower Drum Hydroelectric Facilities (FERC No. 14531)



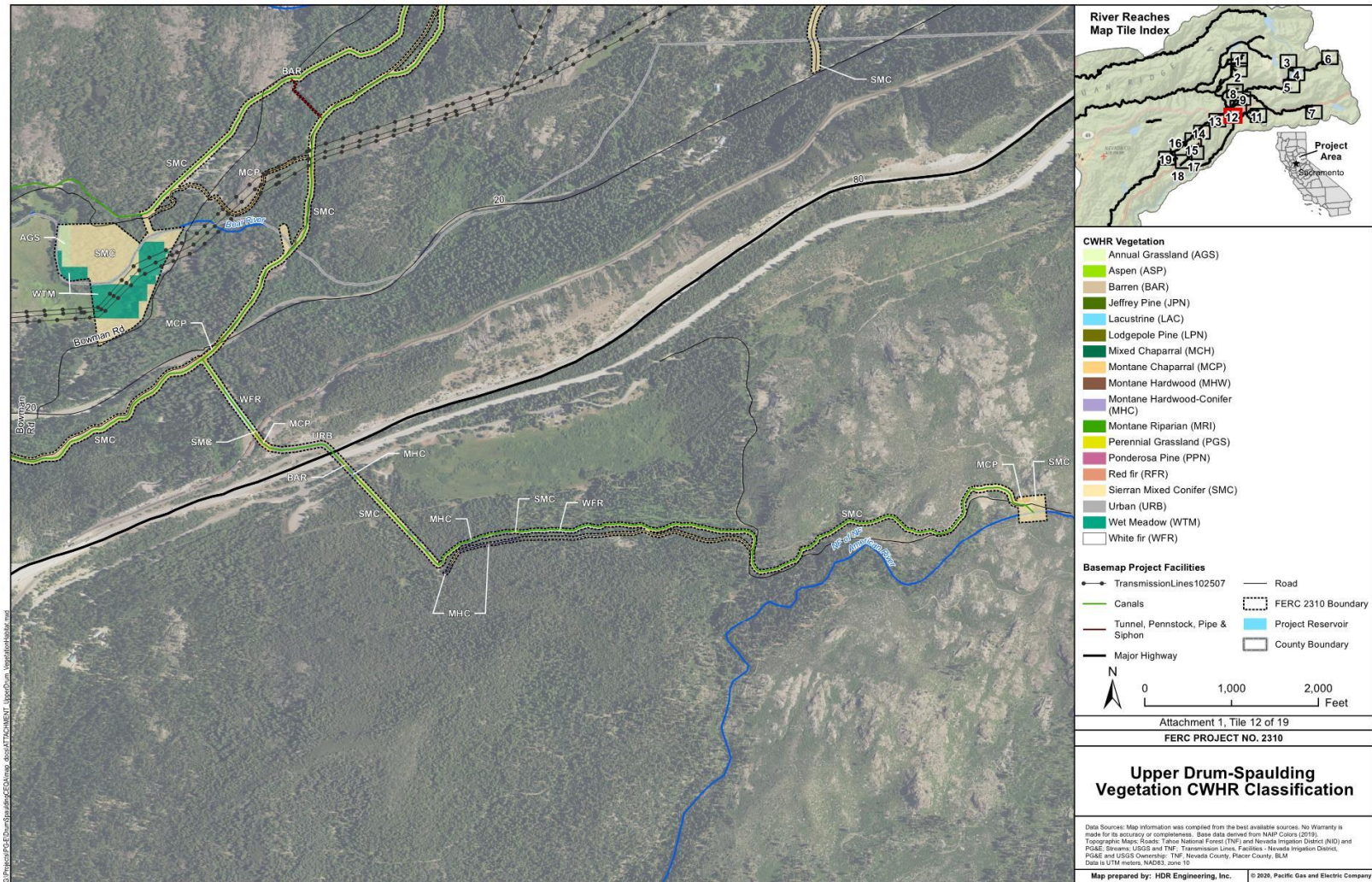


Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Facilities (FERC No. 2310)  
 and Lower Drum Hydroelectric Facilities (FERC No. 14531)





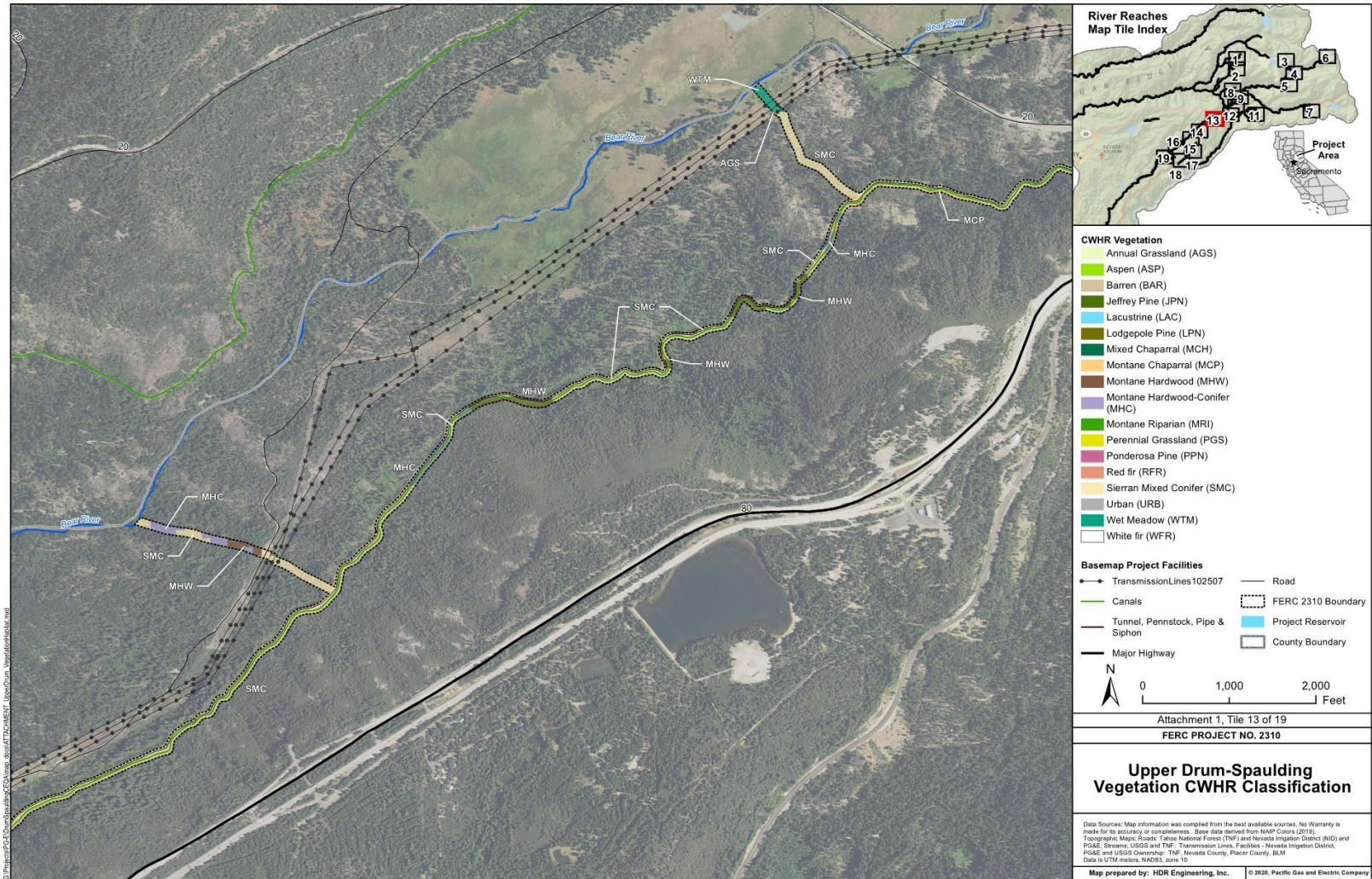
# Appendix C Biological Resources Information PG&E's Upper Drum-Spaulding Hydroelectric Facilities (FERC No. 2310) and Lower Drum Hydroelectric Facilities (FERC No. 14531)





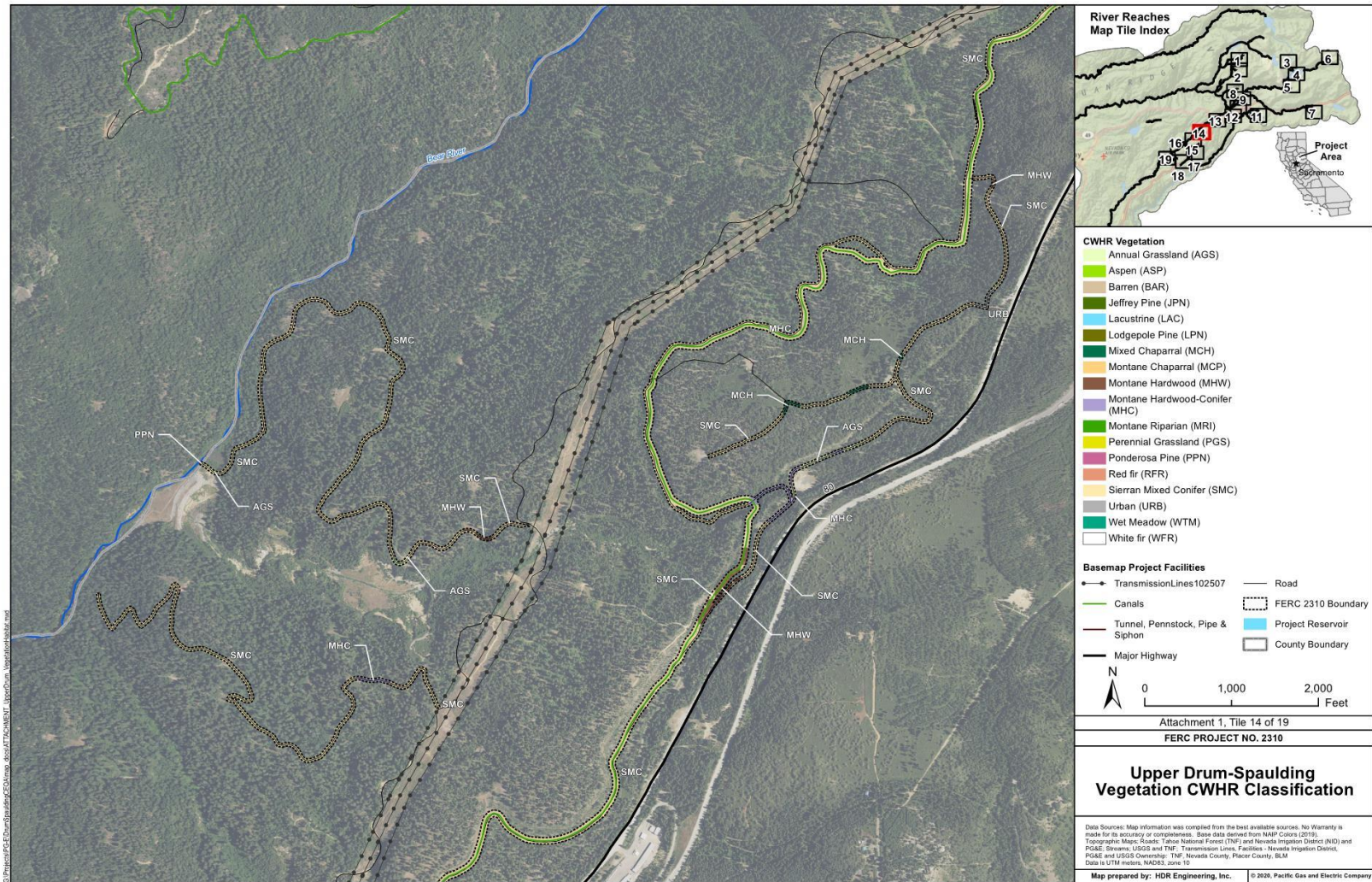
# Appendix C Biological Resources Information

## PG&E's Upper Drum-Spaulding Hydroelectric Facilities (FERC No. 2310) and Lower Drum Hydroelectric Facilities (FERC No. 14531)



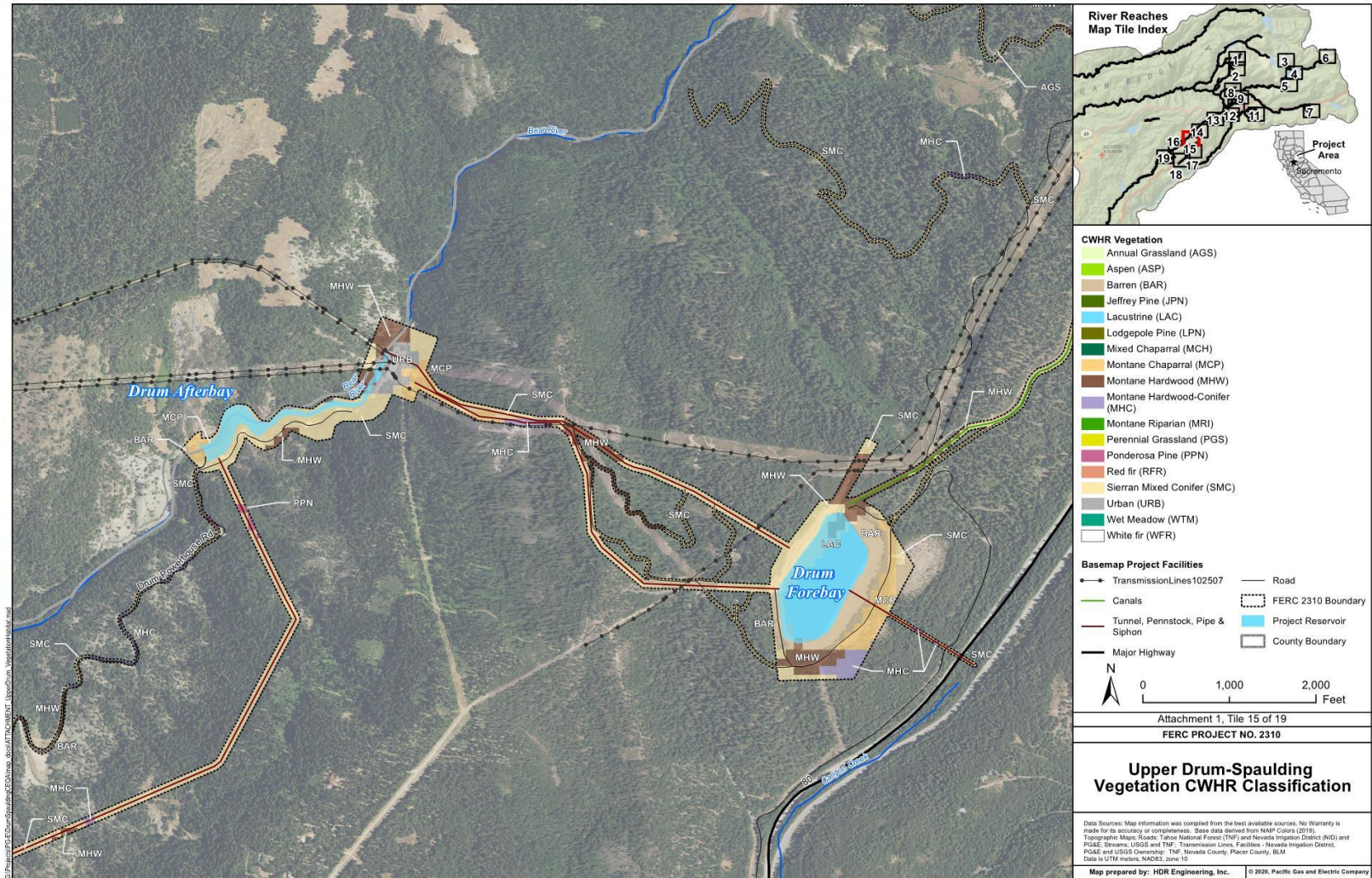


# Appendix C Biological Resources Information PG&E's Upper Drum-Spaulding Hydroelectric Facilities (FERC No. 2310) and Lower Drum Hydroelectric Facilities (FERC No. 14531)



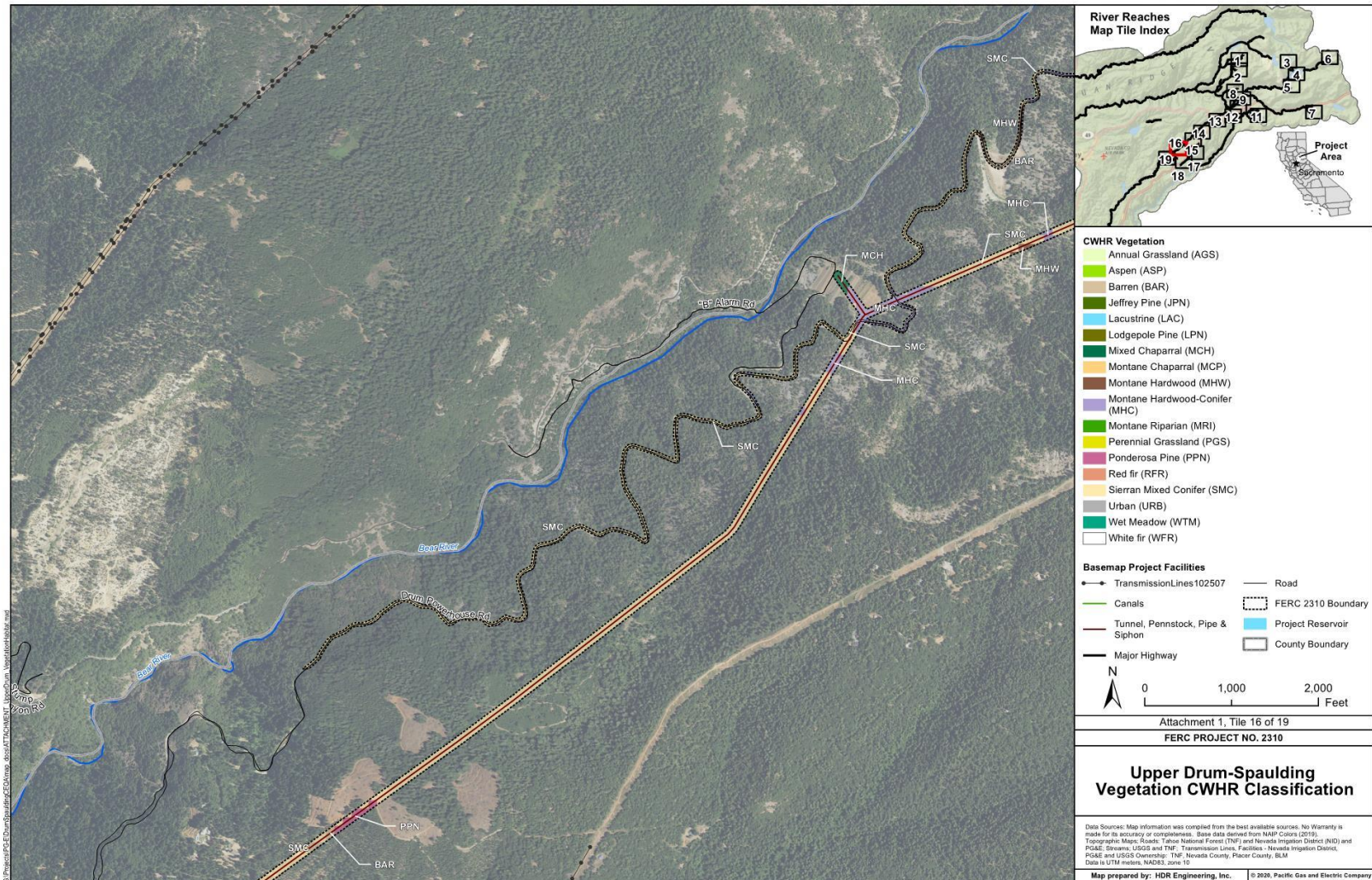


# Appendix C Biological Resources Information PG&E's Upper Drum-Spaulding Hydroelectric Facilities (FERC No. 2310) and Lower Drum Hydroelectric Facilities (FERC No. 14531)



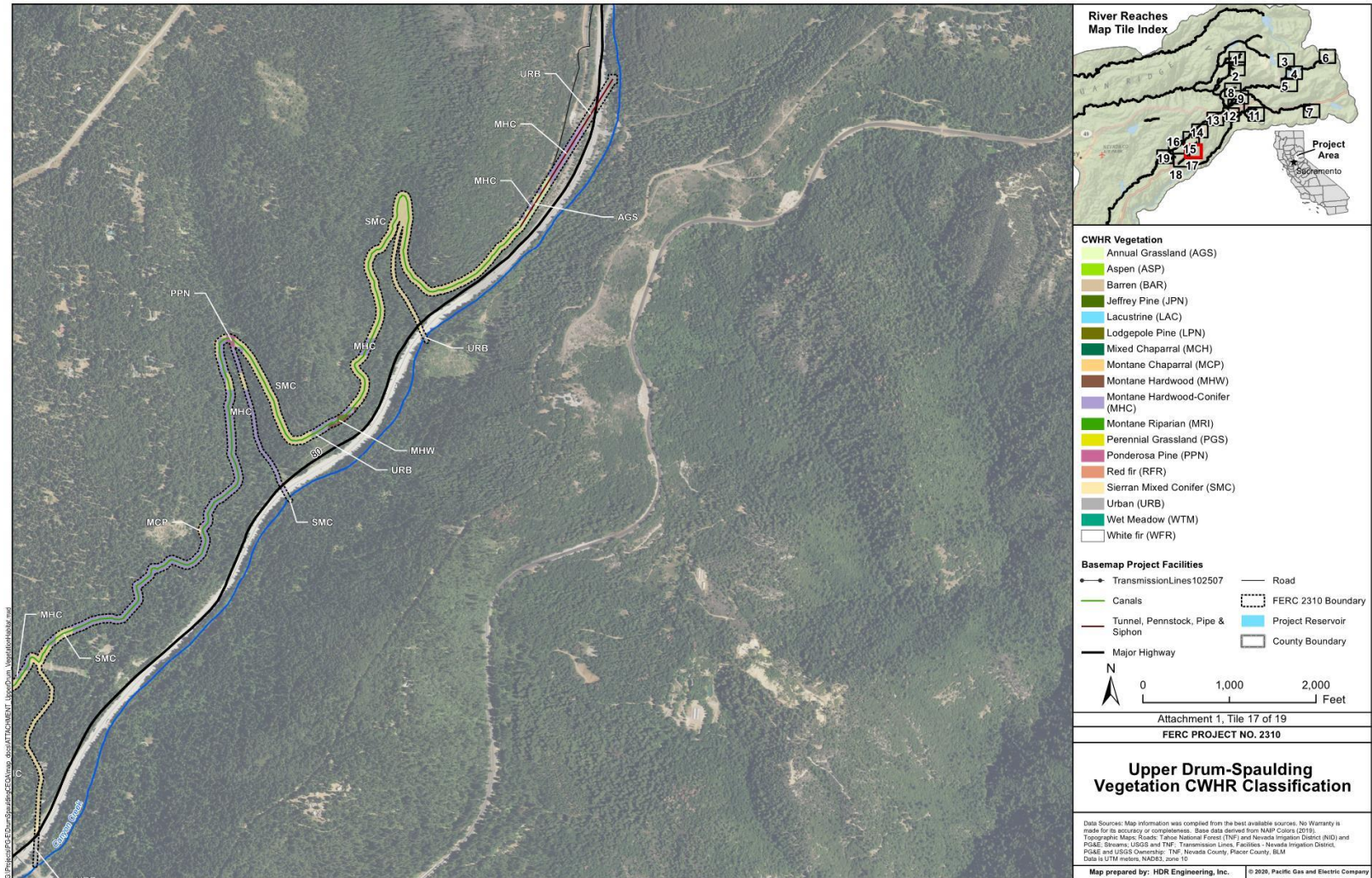


# Appendix C Biological Resources Information PG&E's Upper Drum-Spaulding Hydroelectric Facilities (FERC No. 2310) and Lower Drum Hydroelectric Facilities (FERC No. 14531)



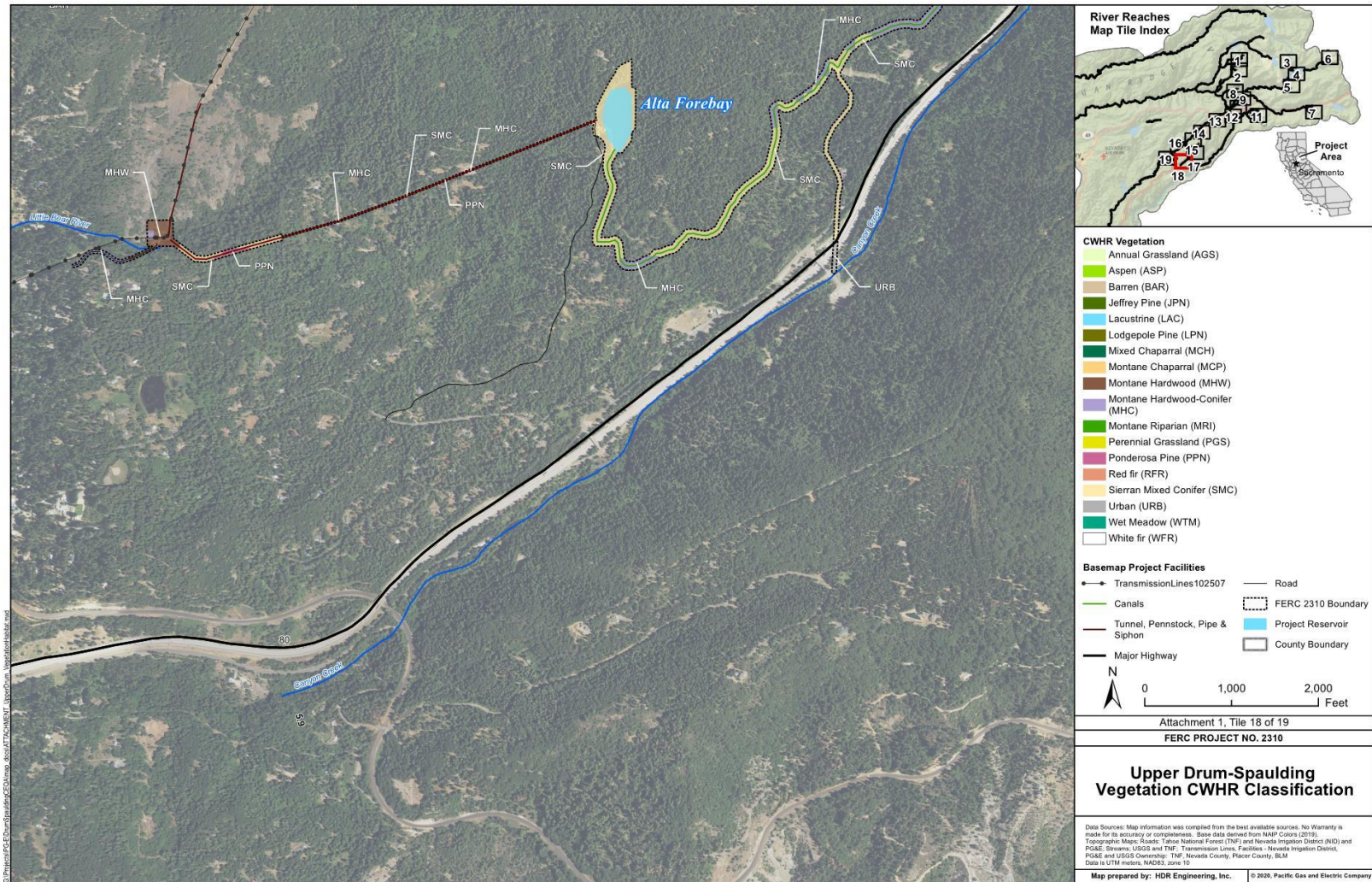


Appendix C Biological Resources Information  
 PG&E's Upper Drum-Spaulding Hydroelectric Facilities (FERC No. 2310)  
 and Lower Drum Hydroelectric Facilities (FERC No. 14531)





# Appendix C Biological Resources Information PG&E's Upper Drum-Spaulding Hydroelectric Facilities (FERC No. 2310) and Lower Drum Hydroelectric Facilities (FERC No. 14531)





# Appendix C Biological Resources Information PG&E's Upper Drum-Spaulding Hydroelectric Facilities (FERC No. 2310) and Lower Drum Hydroelectric Facilities (FERC No. 14531)

