TERR 1 – BOTANICAL RESOURCES TECHNICAL MEMORANDUM

KERN RIVER NO. 1 HYDROELECTRIC PROJECT
FERC PROJECT NO. 1930

PREPARED FOR:

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LIST OF ACRONYMS

A3	Tilled Earth
A7	Agricultural Pond or Water Feature
BA	Barren
C1	Ultramafic Mixed Scrub Alliance
Cal-IPC	California Invasive Plant Council
CALVEG	Classification and Assessment with Landsat of Visible Ecological Groupings
CDFW	California Department of Fish and Wildlife
cfs	cubic feet per second
cm	centimeter(s)
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRPR	California Rare Plant Rank
DBH	diameter at breast height
FERC	Federal Energy Regulatory Commission
Forest Service	United States Forest Service
FSCC	Forest Service Species of Conservation Concern
GIS	Geographic Information System
GPS	Global Positioning System
HG	Annual Grasses and Forbs Alliance
IB	Urban-related Non-vegetated
IPaC	Information for Planning and Consultation
LANDSAT	land satellite
MCV	Manual of California Vegetation
ML	Baccharis (Riparian) Alliance
mm	millimeter(s)
NNIP	non-native invasive plant
NWI	National Wetlands Inventory
NX	Interior Mixed Hardwoods Alliance
PAD	Pre-Application Document
PD	Gray Pine Alliance
POR	period of record
Project	Kern River No. 1 Hydroelectric Project
QD	Blue Oak Alliance
QL	Valley Oak Alliance
QP	California Sycamore Alliance
QW	Interior Live Oak Alliance

RSP	Revised Study Plan
SCE	Southern California Edison
SPD	Study Plan Determination
SSP	special-status plant
SQF	Sequoia National Forest
sq ft	square feet
TM	Technical Memorandum
TSP	Technical Study Plan
TWG	Technical Working Group
USFWS	United States Fish and Wildlife Service
W1	River/Stream/Canal

1.0 INTRODUCTION

This TERR 1 – Botanical Resources Technical Memorandum (TM) provides the methods and findings of field surveys associated with the TERR 1 – Botanical Resources Technical Study Plan (TERR 1 TSP). The TERR 1 TSP was conducted in support of Southern California Edison's (SCE) Kern River No. 1 Hydroelectric Project (Project) relicensing, Federal Energy Regulatory Commission (FERC) Project No. 1930. The TERR 1 TSP was included in SCE's Revised Study Plan (RSP) filed with FERC on February 13, 2024 (SCE 2024). In its March 14, 2024, Study Plan Determination (SPD), FERC approved the TERR 1 TSP with modifications (FERC 2024).

Data for the TERR 1 TM was collected from April 2024 through July 2025. Field sampling efforts and data analysis are complete and summarized below.

2.0 STUDY OBJECTIVES

The objectives of the botanical studies, as outlined in the TERR 1 TSP (SCE 2024), include the following:

- Document vegetation alliances adjacent to Project facilities.
- Document riparian vegetation alliances and wetlands adjacent to Project facilities and the bypass reach.
- Determine the relationship between riparian vegetation alliances and flow conditions in the bypass reach.
- Document special-status plant (SSP) populations at Project facilities.
- Document non-native invasive plant (NNIP) populations at Project facilities.

3.0 STUDY AREA

The extent of the study area for each study component is as follows:

- For vegetation alliances, the study area is 1 mile around Project facilities (see Table 3-1).
- For riparian vegetation alliances and special aquatic features,[1] the study area is the FERC Project boundary (excluding underground Project features and lands overlying the underground Project features); 10 feet on either side of Project access trails located outside the FERC Project boundary; and the bypass reach.

[1] Special aquatic features are defined as lakes, wet meadows, bogs, fens, wetlands, vernal pools, seeps, and springs.

- For the purposes of the SSP and NNIP studies, the study area is the FERC Project boundary (excluding underground Project features and lands overlying the underground Project features) and 10 feet on either side of Project access trails located outside the FERC Project boundary.

Studies were not conducted at locations where access is unsafe (e.g., where there is very steep terrain), or if areas were located on private property for which SCE was unable to obtain approval prior to implementation of the studies.

4.0 METHODS

Study implementation followed the methods described in the TERR 1 TSP (SCE 2024).

4.1 STUDY PLAN VARIANCES

There are no variances from the TERR 1 TSP approved in FERC's SPD (FERC 2024).

4.2 VEGETATION ALLIANCES

The study approach for documenting vegetation alliances in the vicinity of the Project included development of preliminary vegetation alliances maps from available Classification and Assessment with Landsat of Visible Ecological Groupings (CALVEG) data, verification of preliminary maps based on a review of Google Earth aerial photography, implementation of ground-truthing surveys, and development of final vegetation maps. Methods for each of these steps are described below.

4.2.1 Develop Preliminary Maps from Available CALVEG Data

The best available information on vegetation alliances in the study area was used to develop preliminary maps of vegetation alliances within 1 mile of Project facilities. Mapping of vegetation alliances utilized the CALVEG data for the study area (U.S Forest Service [Forest Service] 2014). The CALVEG system is used to classify existing vegetation present on federally managed forestlands based on land satellite (LANDSAT) color infrared satellite imagery. Data were verified using soil-vegetation maps and professional guidance from various sources statewide.

The term "alliance" is used in the CALVEG system and is defined as a uniform group of plant associations sharing one or more dominant or diagnostic overstory species. This term corresponds closely to what plant ecologists call a "community type" and foresters call a "forest type" or "stand." The term community is considered synonymous to the term "alliance" as defined by CALVEG.

Preliminary maps of CALVEG vegetation alliances are available in the Pre-Application Document (PAD), Section 3.6 (SCE 2023).

In addition, the California Natural Diversity Database (CNDDB) was queried to determine if any state-defined sensitive natural communities were present in the study area (CNDDB 2024). The California Department of Fish and Wildlife (CDFW) evaluates sensitive natural

communities at the Global (full natural range within and outside of California) and State (within California) levels resulting in a single G (global) and S (state rank) ranging from 1 (very rare and threatened) to 5 (demonstrably secure) (CDFW 2025). For the purposes of this study, a sensitive natural community is defined as a natural community with a state rank between S1–S3.

4.2.2 Verify Preliminary CALVEG Data Using Aerial Photographs

Pre-field verification of the preliminary vegetation community maps included a review of aerial photographs of the study area (Google 2024). CALVEG data polygons, as shown on the preliminary maps, were compared to aerial photography in Google Earth. Areas where CALVEG data did not appear to correspond to the aerial photographs were marked on hard-copy maps as areas requiring follow-up examination during ground-truthing surveys.

4.2.3 Conduct Ground-Truthing of Vegetation Alliances

Ground-truthing surveys for vegetation alliances were conducted in May 2024. Surveys were conducted in accessible areas identified for follow-up examination during pre-field verification of the preliminary maps, as described above.

Ground-truthing surveys were conducted by a team of two biologists. The following data were collected throughout the study area: date and surveyor names; coordinates and location or facility name; CALVEG vegetation community and field-assessed vegetation community (if different); general site summary; and wildlife species observed on the site. Ground-truthing surveys were not conducted in inaccessible areas. To the extent possible given the steep walls of the Kern Canyon, inaccessible areas were evaluated using aerial imagery review (Google 2024) and by scanning inaccessible areas on-the-ground from open vantage points, as appropriate.

Vegetation community type was verified by comparing dominant overstory species observed at each site with the dominant overstory species that characterize the vegetation community as described in the Vegetation Descriptions South Sierran Ecological Province CALVEG Zone 4 (Forest Service 2009a) and Vegetation Descriptions Central Valley Ecological Province CALVEG Zone 5 (Forest Service 2009b). For sites in which the CALVEG-designated vegetation community on the preliminary maps did not appear to be correct, the new vegetation community was noted, and hard-copy vegetation community maps were marked to indicate the extent of the field-corrected vegetation community.

Distinct patterns between aerial imagery characteristics and vegetation alliances observed during the ground-truthing survey were used to extrapolate vegetation alliances within 1 mile of the FERC Project boundary that were inaccessible and/or not visible from open vantage points. After returning from the field, such inaccessible areas were examined using high resolution Google Earth imagery and any vegetation alliances were corrected.

4.2.4 Develop Final CALVEG Vegetation Community Maps

Final maps of vegetation alliances were developed based on existing CALVEG data, review of Google Earth aerial photography, and ground-truth surveys. Refer to Section 5.0.

Hard-copy corrections to vegetation community maps completed during review of aerial photographs and ground-truthing surveys were digitized and incorporated into Geographic Information System (GIS) layers.

4.3 RIPARIAN VEGETATION ALLIANCES AND SPECIAL AQUATIC FEATURES

The study approach for documenting riparian vegetation alliances and special aquatic features in the vicinity of the Project included development of preliminary vegetation alliances maps, implementation of ground-truthing surveys, and development of final riparian and wetland vegetation maps. Methods for each of these steps are described below.

4.3.1 Develop Preliminary Maps from Available Data

In addition to using the CALVEG system (as described in Section 4.1 above), preliminary maps of riparian vegetation alliances and special aquatic features were compiled from the United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) Data (USFWS 2024a). The National Wetlands system is the official USFWS wetland classification system and the Federal standard for wetland classification. Wetlands are classified by trained analysts at the USFWS that identify and classify wetland habitats from aerial imagery. Riparian and wetland mapping within the vicinity of the Project was based on 1985 imagery.

Preliminary maps of these riparian vegetation alliances are available in the PAD, Section 4.9 (SCE 2023).

4.3.2 Conduct Ground-Truthing of Riparian Vegetation Alliances and Wetlands

Ground-truthing included documenting riparian alliances within the FERC Project boundary, 10 feet on either side of Project access trails located outside the FERC Project boundary, and the bypass reach. This ground-truthing was conducted in May 2024 during CALVEG ground-truthing surveys described above in Section 4.1.3. Documentation of small-scale vegetation alliances followed the Manual of California Vegetation (MCV) classification system (Sawyer et al. 2009), which defines vegetation alliances based on the dominant species present in the alliance. MCV classification is more suited to smaller-scale alliances that are associated with particular aspects and soil types, as is typically found in riparian and wetland communities.

Inaccessible areas were evaluated using aerial imagery review (Google 2024) and by scanning with binoculars from open vantage points, as appropriate.

Riparian and wetland alliances were then marked on either hard copy maps and/or were digitized on an iPad unit using the ArcGIS FieldMaps program.

4.3.3 Develop Final Riparian Vegetation Alliance and Special Aquatic Features

Final maps of riparian vegetation alliances and wetlands were developed based on existing CALVEG and NWI data, review of Google Earth aerial photography, and ground-truthing surveys. Refer to Section 5.0.

Hard-copy corrections to vegetation community maps completed during review of aerial photographs and ground-truthing surveys were digitized and incorporated into GIS layers.

4.3.4 Characterize the Relationship Between Riparian Vegetation and Flow Conditions

To characterize the relationship between riparian flow conditions, the following steps were conducted:

- First, 10 representative riparian cross-sectional transects along the bypass reach were sampled to obtain riparian vegetation metrics. Data collected at transects was modeled against stage-discharge relationships over a range of flows (high to low).

- After the model was developed, a summary of the relationship between existing inundation characteristics (e.g., timing, frequency, depth, and width of inundation) and the distribution of the dominant riparian species was developed.

- Finally, a discussion of hydrology in the bypass reach in relation to riparian vegetation recruitment and maintenance (for both existing Project and without Project) was developed. A discussion of the methods for each step is provided below.

4.3.4.1 Select Riparian Transects and Collect Field Data

Ten representative transects were selected to conduct riparian cross-section sampling after completion of field riparian mapping efforts along the bypass reach.

First, a desktop stream classification was conducted using Google Earth (Google Earth 2024) aerial imagery, and the bypass reach was divided into segments based on visible geomorphological characteristics (e.g., channel slope, stream width, and extent of the floodplain). Based on the initial assessment, four broad stream segments that captured the diversity of geomorphological conditions were defined. Riparian vegetation diversity is minimal along the bypass reach, and therefore this was a secondary consideration.

A field visit was conducted in May 2024 to determine the specific transect locations (within the broader stream segments). Transects were established in locations that exhibited appropriate hydrological conditions for flow measurement (refer to the AQ 1 TM) and that allowed for safe access. The lower Kern River is one of the most dangerous rivers for

swimmers in California because of the steep canyon walls and dangerous rapids systems (Class IV and V+), and therefore surveyor safety was prioritized. The transect start location on the river-left side was marked with iron rebar headpins and flagging. During transect establishment, the flows in the Kern River were too high to safely establish headpins on the river-right side.

Riparian vegetation metrics were collected at each of the transects in late September and early October 2024, when flows had receded enough for surveyors to attempt to cross the Kern River. 5- by 5-meter sampling plots were then placed along the transects (i.e., one on each bank), or more, depending on the width of the riparian corridor along the cross-section.

The following data was collected at each transect:

- Global Positioning System (GPS) coordinates of the headpins
- Photograph of the transect
- The total length of the transect (as measured by a meter tape strung between the headpins on each side of the river)
- The extent of riparian vegetation along the transect on either side of the river

The following data was collected within each 5- by 5-meter sampling plot along the transect:

  – GPS coordinates of the center point of the sampling plot

  – Photograph of the plot, looking towards the cross-section line

  – Percent cover for each dominant woody riparian trees/shrubs, by species

  – Age class for each dominant woody riparian trees/shrubs, by species. Age class structure was determined based on categories of shrub stem densities per individual and tree diameters, as follows:

    ➢ Young (Y): shrubs with less than 10 stems per individual or trees with dbh less than 3 inches

    ➢ Medium-aged (M): shrubs with between 10 and 60 stems per individual or trees with diameters at breast height (DBH) between 3 and 9 inches

    ➢ Old/Mature (O): shrubs with more than 60 stems per individual or trees with DBH greater than 9 inches

  – Percent cover for each dominant herbaceous plants (including herbs and graminoids), by species

– Size class of the substrate present (bedrock, boulder, cobble, gravel, sand, and silt)

A GIS map showing the location of the cross-sections and sampling plots was then developed. Lists and tables were then developed summarizing the species composition, distribution, and abundance across the bypass reach. Refer to Section 5.0.

4.3.4.2 Describe the Relationship Between Existing Inundation Characteristics and Riparian Distribution

To model the relationship between existing inundation characteristics and riparian distribution, stage-discharge relationships were developed at each of the transects over range of hydrologic flows (high to low) in coordination with the AQ 1 – Hydrology TM (SCE 2025). Specifically, stage-discharge points were collected at four representative flows on the transects. Both the Existing Project and Without-Project hydrology scenarios were modeled and these flows were then plotted against the elevation profile and riparian corridor width for each transect. Relationships between existing inundation characteristics and the distribution of dominant riparian species within the bypass reach were then summarized.

4.3.4.3 Describe Hydrology and Riparian Recruitment in the Bypass Reach

After the completion of the stage-discharge relationships, as described above, the patterns of inundation on the transects were compared to metrics of flowering, seed set, and recession rate tolerance, as described in the scientific literature for the dominant woody riparian species observed on the transects. Based on these results, a description of Project hydrology and riparian recruitment patterns was then developed.

4.4 SPECIAL-STATUS PLANTS

The study approach for documenting SSPs in the study area included development of preliminary information and conducting protocol SSP surveys. Each of these is described below.

4.4.1 Develop Preliminary Information on Special-Status Plants in the Study Area

Development of preliminary information on SSPs included compilation and review of relevant literature, databases and online resources, as well as consultation with resource agencies. The following sources were used to compile existing information on SSPs within the Kern River watershed:

- Kern River No. 1 Hydroelectric Project (FERC Project No. 1930) PAD, Volume 2 (SCE 2023)
- Sequoia National Forest (SQF) Species of Conservation Concern (FSCC) List (Forest Service 2023)

- California Natural Diversity Database (CNDDB) (CNDDB 2024)
- USFWS Information for Planning and Conservation (IPaC) online database (USFWS 2024b)
- California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants of California online database (CNPS 2024)

Existing species lists included in the PAD (SCE 2023) provided a basis for identification of known and potentially occurring SSPs. Occurrence maps and species lists included in the PAD were updated with current information obtained from the above-listed resources.

4.4.2 Conduct Special-Status Plant Surveys

The following describes the timing and methods for field surveys conducted to document the presence of SSPs.

4.4.2.1 Survey Timing

Field surveys were conducted at the proper time of year when rare, threatened, or endangered plants are evident and identifiable. Generally, this is when the plants are flowering. Based on the blooming periods for plants known or potentially occurring within the vicinity of the Project, an early season survey was conducted in April 2024, and late season surveys were conducted in late June/early July 2025.

The timing of surveys was verified based on reference population monitoring, which occurred immediately before each survey period. SCE consulted with resource agencies regarding the timing of surveys, as follows:

- SCE contacted the Terrestrial Technical Working Group (TWG) for the Project relicensing on March 28, 2024 to solicit input regarding target special-status species and potential reference populations to be monitored in advance of early season surveys. On April 16, 2024, SCE notified the Terrestrial TWG of the results of reference population monitoring and proposed timing of early season SSP surveys. No responses were received.
- SCE contacted the Terrestrial TWG again on July 8, 2024 regarding monitoring of reference populations prior to late season surveys. On July 18, 2024, SCE e-mailed the Terrestrial TWG the results of reference population monitoring and proposed timing of late season surveys. On August 29, 2024, SCE e-mailed the Terrestrial TWG that late season surveys were being postponed due to road closures, evacuations, and safety concerns associated with the Borel Fire. The SQF botanist acknowledged receipt of the August 29 email.
- SCE contacted the Terrestrial TWG on June 9, 2025 to obtain input regarding potential reference populations to be monitored in advance of late season surveys. On June 25, 2025, SCE notified the Terrestrial TWG of the results of reference

population monitoring and proposed timing of late season SSP surveys. No responses were received.

Survey Methods

Survey methods for SSPs followed procedures outlined in the *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities* (CDFW 2018).

Surveys were completed by two biologists implementing systematic field techniques (e.g., zigzag patterns, random meandering, and linear transects) to cover the entire study area, where accessible. Areas that could not be safely accessed (or where the owner did not grant permission to enter) were surveyed using binoculars, to the degree possible. Surveys were floristic in nature; that is, all species were identified to the level (i.e., genus, species, variety or subspecies) required to determine if that species was special status. Nomenclature followed *The Jepson Manual, Vascular Plants of California* (Baldwin et al. 2012), and a comprehensive list of species observed during field surveys was compiled.

Data collected for each population included: an estimate of the number of individuals present, digital photographs, GPS location, area (square feet), and a description of associated vegetation. If a SSP population was identified on the perimeter of the study area, the study area was expanded to document the full extent of the population.

Moss specimens were collected throughout the survey area and labeled with the date and collection location. Moss specimens were sent to a qualified bryologist for identification.

California Native Species Field Survey forms were developed for all SSP populations identified and submitted to the CNDDB.

4.4.3 Develop Final Special-Status Plant Maps

Following completion of surveys, GIS data were processed, and maps were developed to show the location of SSP populations in the study area. Refer to Section 5.0.

4.5 NON-NATIVE INVASIVE PLANTS

The approach for documenting NNIPs in the study area included development of preliminary information and conducting NNIP surveys. Each of these is described below.

4.5.1 Develop Preliminary Information on Non-Native Invasive Plants in the Study Area

A preliminary list of NNIPs potentially occurring in the vicinity of the Project was developed for the PAD (SCE 2023). This preliminary list, which included 154 species, was generated based on the California Invasive Plant Inventory (Inventory) (California Invasive Plant Council [Cal-IPC] 2022). Cal-IPC defines NNIPs as plants that (1) are not native to, yet can spread into, wildland ecosystems; and (2) that also displace native species, hybridize with native species, alter biological communities, or alter ecosystem processes (Cal-IPC

2022). The Inventory was queried for two parameters (i.e., Jepson geographic floristic province and general habitat types [grassland, riparian, woodland, and scrub habitat]). Prior to implementation of the TERR 1 botanical surveys, this list was refined based on updated information on CALVEG vegetation alliances in the study area, as well as Forest Service publications pertinent to the study area (Moore and Gerlach 2001).

SCE contacted the Terrestrial TWG by e-mail on March 28, 2024 to solicit input regarding target NNIPs. No responses were received.

4.5.2 Conduct Non-Native Invasive Plant Surveys

Focused NNIP surveys were conducted in conjunction with SSP surveys. The following data were collected for each NNIP population: species, location, area infested, and level of infestation. Levels of infestation were reported as: low (<5 percent cover); moderate (6–25 percent cover), and high (>25 percent cover). Areas that were surveyed and found to be weed-free were also identified. Each population was assigned a unique population ID (according to the criteria outlined above for SSPs), and areas of infestation were mapped with a hand-held GPS unit. Where possible, if an NNIP population was identified on the perimeter of the study area, the study area was expanded to document the full extent of the population.

4.5.3 Develop Final Non-Native Invasive Species Maps

Following completion of surveys, GIS data were processed, and maps were developed to show the location of NNIP populations in the study area. Refer to Section 5.0.

5.0 RESULTS SUMMARY

This section provides details on the results for documentation of vegetation alliances, riparian and wetland alliances, relationship between riparian vegetation alliances and flow conditions, SSPs, and NNIPs.

5.1 VEGETATION ALLIANCES AND WILDLIFE HABITATS

Preliminary vegetation alliance maps based on the existing CALVEG data for the study area were completed in 2023 and were included in the PAD (SCE 2023). Preliminary vegetation alliance maps were ground-truthed during wildlife reconnaissance surveys and evaluated against recent aerial imagery sources (Google Earth 2024).

A query of CNDDB yielded no sensitive natural communities identified in the study area (CNDDB 2024). Sensitive natural communities were identified during riparian vegetation mapping and are described further in Section 5.2, below. Ground-truthing identified several inconsistencies in the preliminary vegetation alliance maps that were corrected. Preliminary maps did not include California Sycamore (QP), Interior Live Oak (QW), Barren (BA), Urban-Related Bare Soil (IB), and Agriculture Pond or Water Feature (A7) alliances, which were subsequently identified during ground-truthing. For example, the tributary streams of Lucas Creek and Cow Flat Creek were identified as having riparian zones consisting of Baccharis Alliances (ML) and Valley Oak Alliances (QL), respectively,

on preliminary maps. Ground-truthing revealed that both tributaries supported California Sycamore (QP) vegetation alliances within the riparian zones of these creeks.

The ground-truthing identified 14 CALVEG alliances in the study area, including the following:

- Herb-dominated Alliances:
  - Annual Grasses and Forbs Alliance (HG)

- Shrub-dominated Alliances:
  - Ultramafic Mixed Scrub Alliance (C1)
  - Baccharis (Riparian) Alliance (ML)

- Tree-dominated Alliances:
  - Interior Mixed Hardwoods Alliance (NX)
  - Gray Pine Alliance (PD)
  - Blue Oak Alliance (QD)
  - Valley Oak Alliance (QL)
  - California Sycamore Alliance (QP)
  - Interior Live Oak Alliance (QW)

- Non-Vegetated Areas:
  - Tilled Earth (A3)
  - Barren (BA)
  - Urban-related Non-vegetated (IB)

- Aquatic Areas
  - Agriculture Pond or Water Feature (A7)
  - River/Stream/Canal (W1)

California sycamore dominated vegetation communities are considered a sensitive (G3 S3) natural community (CDFW 2025); therefore, California Sycamore Alliance (QP) would be considered a sensitive natural community.

Refer to Map 5-1 for the location of vegetation alliances in the study area and Appendix A for a detailed description of each of the CALVEG alliances identified in the study area.

5.2 RIPARIAN VEGETATION ALLIANCES AND SPECIAL AQUATIC FEATURES

Preliminary riparian alliance maps based on the existing CALVEG data for the study area were completed in 2023 and were included in the PAD (SCE 2023).

Special aquatic features are defined by the Forest Service to include lakes, ponds, meadows, wetlands, springs, and seeps (Forest Service 2004). Democrat Dam is the only lake in the study area. No other special aquatic features were identified during field surveys.

Five MCV riparian alliances were identified adjacent to the FERC Project boundary, 10 feet on either side of Project access trails located outside the FERC Project boundary, and the bypass reach during field surveys, including the following:

- *Baccharis salicifolia* Shrubland Alliance (mule-fat thickets) (G5 S4)
- *Platanus racemosa – Quercus agrifolia* Woodland Alliance (California sycamore – Pacific live oak riparian woodlands) (G3 S3)
- *Salix exigua* Shrubland Alliance (sandbar willow thickets) (G5 S4)
- *Salix lasiolepis* Shrubland Alliance (arroyo willow thickets) (G4 S4)
- *Salix lucida* ssp. *lasiandra* Woodland Alliance (shining willow groves) (G4 S3)

Two of these riparian communities, including *Platanus racemosa – Quercus agrifolia* Woodland Alliance (California sycamore – Pacific live oak riparian woodlands) and *Salix lucida* ssp. *lasiandra* Woodland Alliance (shining willow groves) have a state rank of S3 and are therefore considered sensitive natural communities.

The Kern River in the study area supports primarily the California sycamore – Pacific coast live oak woodland alliance.[2] This alliance is present along most of the bypass reach from the Kern River No. 1 Powerhouse to Democrat Dam. In addition, patches of shining willow grove mule-fat thicket were mapped along tributary creeks (Stark Creek and Dougherty Creek).

North of Democrat Dam, the riparian alliances included primarily feature mule-fat thickets intermixed with smaller patches of shining willow groves, sandbar willow thickets, and arroyo willow thickets.

Refer to Map 5-2 for the location of riparian alliances and special aquatic features in the study area and Appendix A for a detailed description of each of the MCV alliances identified in the study area.

5.2.1 Characterize the Relationship Between Riparian Vegetation and Flow Conditions

A summary of the structure and composition of the riparian community along the bypass reach sampled during this study is provided below.

[2] Oak trees in the study area were identified as interior live oak (*Quercus wislizenii*) based on the phenology of the trees on site. However, the MCV manual does not include a California sycamore – interior live oak riparian woodland alliance: it only includes the California sycamore – Pacific coast live oak riparian woodland alliance. Furthermore, MCV online maps that California sycamore – Pacific live oak riparian woodlands are present in the study area. Therefore, we have used the *Platanus racemosa – Quercus agrifolia* Woodland Alliance in our study results.

5.2.1.1 Select Riparian Transects and Collect Field Data

Refer to Map 5-3 for the location of the 10 riparian transects that were established to characterize riparian habitats along the bypass reach. Refer to Table 5-1 and Figure 5-1 for the four stream segments, 10 transect locations, and gradient for each segment. The average gradient of the Kern River between Democrat Dam to the Kern River No. 1 Powerhouse is 1.8 percent. Refer to Appendix B for representative photographs of each transect. Table 5-2 provides summary data on the total percent cover and species richness for woody riparian trees/shrubs and herbaceous/graminoid plants, as well as the age classes of woody riparian trees/shrubs, for each transect.

Note that field biologists did not attempt to access the far (river-left) side of the Kern River at transects KT1, KT2, KT3, and KT6 due to dangerous conditions at the time of the surveys (i.e., proximity to rapids, strong currents, undercurrents, and wide river sections). Conditions on the opposite bank were observed to the extent possible using binoculars to record species present and substrate composition.

Provided below is a more detailed characterization of woody and herbaceous vegetation documented along the riparian transects.

Woody Riparian Vegetation

Refer to Table 5-3 for a list of woody riparian species observed at each transect. Refer to Figure 5-2 for the average percent cover of woody riparian species across sampling plots. Refer to Figure 5-3 for the frequency that each woody riparian species was observed within the sampling plots.

Of the 11 shrub/tree species observed, California sycamore was the most common, being observed at 10 of 22 total plots and accounting for an average of 17.5 percent cover across the 18 accessible plots. The second most abundant species was the red willow, accounting for an average of 14.3 percent of the coverage area across accessible plots, but only being observed at four plots. Mule-fat and narrowleaf willow were also abundant accounting for an average of 11.6 percent and 10.7 percent coverage, respectively. Mule fat was observed at six plots and narrowleaf willow was recorded at three plots. Goodding's willow (*Salix gooddingii*) was the final willow species encountered appearing at only one plot and accounting for an average of 5.2 percent coverage. Other species observed included common buttonbush (*Cephalanthus occidentalis*), Fremont cottonwood (*Populus fremontii*), interior live oak (*Quercus wislizeni*), American black nightshade (*Solanum americanum*), tree tobacco (*Nicotiana glauca*), and Pacific poison oak (*Toxicodendron diversilobum*). On average, these species accounted for less than 3 percent coverage, although interestingly, common buttonbush was observed at seven plots, the second highest total. The remaining species occurred at 3 plots or less.

Woody species recorded using binoculars to view in inaccessible portions of the river include mule-fat, common buttonbush (*Cephalanthus occidentalis*), and California sycamore.

Herbaceous Vegetation

Refer to Table 5-4 for a list of the herbaceous and graminoid plant species observed by transect.

Swamp smartweed (*Persicaria hydropiperoides*) was the most encountered herbaceous species, being found at 10 transects and representing anywhere from 5 to 40 percent cover at these locations. Canadian horseweed (*Erigeron canadensis*) and marsh bristlegrass (*Setaria parviflora*) were both identified at eight plots. Canadian horseweed made up 60 percent of the herbaceous vegetation at plot KT6-1, but never represented more that 8 percent coverage at any other transects. Marsh bristlegrass represented 1 to 40 percent herbaceous cover at plots where present. Sacred thorn-apple (*Datura wrightii*) was the only other herbaceous plant to grow at more than four transects. While this species was found at six transects, it accounted for only 1 percent average coverage at all transects, with the exception of plot KT9-2 where it accounted for 40 percent coverage. In general, no herbaceous plants accounted for greater than 40 percent coverage at any one site, except for two instances. Lakeshore sedge (*Carex lenticularis*) represented 75 percent coverage at plot KT5-1 and the previously mentioned Canadian horseweed coverage at plot KT6-1.

Note that one species, ripgut brome (*Bromus diandrus)*, observed at two of the riparian transects is considered a non-native invasive species by the Sequoia National Forest (Forest Service 2025).

5.2.1.2 Describe the Relationship Between Existing Inundation Characteristics and Riparian Distribution

Stage-discharge data were collected at four flow rates (31 cubic feet per second [cfs], 272.6 cfs, 448.5 cfs, and 966 cfs). Plots of the regressions can be found in Appendix C, Figures C-1 through C-10. Refer to the AQ 1 – Hydrology TM for more information on flow modeling.

These stage-discharge models were used to calculate the 2-year recurrence flow to determine the amount of riparian habitat that is inundated at the left bank of each transect. The right bank of the transects was not modeled because high flows prevented safe access. At the 2-year recurrence flow, the riparian vegetation at nine of the 10 transects were at least partially inundated. Transect KT9 was the only transect that did not have inundation at the 2-year recurrence flow, but would be inundated at higher flows. Transects KT5, KT6, and KT10 had the highest rate of inundation at the 2-year recurrence flow. Refer to Figures C-11 through C-20 in Appendix C for the percent inundation under the Existing Project and Without-Project hydrology scenario on the left bank of each transect.

5.2.1.3 Describe Hydrology and Riparian Recruitment in the Bypass Reach

The patterns of riparian vegetation establishment and distribution along a river are created by the interaction of physical processes (e.g., flows of varying magnitudes, timing of flows, flow recession rates, flow and depth to water table variability, and sediment deposition) and the different life history characteristics of the dominant species. The

woody riparian species present along the bypass reach have many life history adaptations that promote their success under dynamic and episodic, yet seasonally predictable, hydrologic conditions.

High magnitude, infrequent flow events (scouring flows) maintain the channel by scouring banks and the channel bed, and are important for maintaining channel complexity. These events create areas for new colonization by riparian species and maintain the compositional and structural diversity of the riparian community. The scouring flows are also important for limiting encroachment of riparian vegetation into the channel by scouring vegetation along the channel margins, which reduce the potential for berm development and channel narrowing. Riparian species can also readily reproduce vegetatively from downed or abraded limbs, trunks, and root sprouts or from twig or root pieces deposited during a high flow event. This resiliency enables these species to rapidly re-establish following scouring flood events.

The magnitude, timing, and flow recession of spring flows (recruitment flows) are important determinants for successful regeneration and establishment of riparian species. For successful recruitment to occur, flows that coincide with the release of seeds with suitable recession rates are necessary to provide sufficient moisture to the seedlings and sprouts. This hydrology may occur in the same year as the scouring flow or may occur several years later (Mahoney and Rood 1998; Dixon 2003; Karrenberg 2002; Merritt et al. 2009; Stella et al. 2013). The dominant species in the bypass reaches, California sycamore and willows, release seeds in the early spring, timed with the natural snowmelt hydrograph at this elevation. These seeds are only viable for a short period of time (weeks), requiring suitable moisture and soil conditions to be present at the time of seed release. For seedlings to survive, flow recession rates mut be slow and groundwater must be available through the dry summer. Recession rates from the spring flows cannot exceed the root growth rates of the seedlings.

Results from studies in the literature indicate that seedlings typically survive down ramping rates that range from 0.4 to 1.6 inches per day, and up to3.9 inches per day, depending on factors such as species, substrate characteristics, and other sources of water (e.g., seeps, hillslope runoff, precipitation) (Braatne et al. 1996; Shafroth et al. 2017). Seedlings that establish too close to the channel where late summer and fall water is available are more susceptible to scouring and uprooting by subsequent high winter or spring flows. As a result, riparian vegetation often establishes in elevation zones where water is available during the drier months, but not too close to the base flow (summer and fall) channel where it is susceptible to damage by higher flows.

A summary of the life history strategies of the dominant woody riparian species present along the bypass reaches is provided in Appendix D. The timing of blooming and seed dispersal of these common species is summarized in Appendix E.

The relationship between hydrology and riparian vegetation recruitment and maintenance in the bypass reach is described below. Specifically, the frequency of high flows and flow recession rates are discussed in relation to important riparian recruitment and maintenance

metrics. The Existing Project hydrology and Without-Project hydrology scenarios are compared in detail in the AQ 1 – Hydrology TM (SCE 2025).

- **Frequency of High Flows for Riparian Recruitment:** Seed dispersal for the dominant woody riparian species occurs in spring. Over the period of record (POR) (1990–2023), inundation occurs in spring at all 10 of the transects under Existing Project hydrology scenario. Under the Without-Project hydrology scenario, approximately 30 to 40 percent more days are inundated during the spring seed set. However, as described below, the 2-year recurrence interval modeling indicates that Existing Project hydrology provides sufficient flow for dispersal and recruitment. Refer to Figures C-21 through C-30 in Appendix C for a comparison of inundation under Existing Project and Without-Project hydrology scenarios across all 10 riparian transects.

  The 2-year recurrence interval was also compared between Existing Project and Without-Project hydrology scenarios over the POR (1990–2023). The 2-year recurrence interval is an important metric to compare patterns of inundation that would allow regular dispersal and recruitment of riparian seedlings in the bypass reach. As shown on Figure 5-4, Existing Project and Without-Project hydrology scenarios show only minor differences in recruitment flows (1,331 cfs under Existing Project compared to 1,631 without Project). Therefore, Existing Project hydrology allows for sufficient flows for riparian recruitment.

- **Recession Rates for Riparian Maintenance:** Literature studies show that seedlings of dominant woody riparian species typically survive flow recession rates that range from 0.4 to 1.6 inches per day, and up to 3.9 inches per day depending on the substrate and alternative sources of water (e.g., seeps, hillslope runoff, precipitation [Braatne et al. 1996; Amlin and Rood 2002; Shafroth et al. 2017]). Recession rates under existing Project hydrology averaged much less than 1.6 inches per day, indicating that inundation is sufficient for the growth and maintenance of riparian vegetation. Refer to Figures C-31 through C-40 in Appendix C for the average yearly recession rates in dry, normal, and wet water years across all 10 riparian transects. These plots include reference lines that show a 1.6 inches per day recession rate.

5.3 SPECIAL-STATUS PLANTS

Based on the database and literature search, 16 SSP species were determined to have the potential to occur within the vicinity of the Project. This includes six SSPs documented as historically occurring within the FERC Project boundary, including rose-flowered larkspur (*Delphinium purpusii*), calico monkeyflower (*Diplacus [=Mimulus] pictus*), greenhorn fritillary (*Fritillaaria brandegeei*), Shevock's golden aster (*Heterotheca shevockii*), southern Sierra monardella (*Monardell lioides* ssp. *aenmonoides*), and Bakersfield cactus (*Opuntia treleasei*). These 16 species, listed in Appendix F, comprise the target species for the TERR 1 SSP surveys.

Early season botanical surveys were conducted April 25–29, 2024 and late season botanical surveys were conducted June 30–July 4, 2025. One special-status plant, rose-flowered larkspur, which is a Forest Service Species of Conservation Concern with a California Rare Plant Rank of 1B.3, was identified during the early season botanical surveys within the study area. Surveyors documented nine new populations of this species, ranging between approximately 1 to 1,800 square feet and supporting collectively a total of approximately 434 individuals. The populations documented did not coincide with previously reported populations. No additional SSPs were observed during the early season surveys or late season surveys.

Table 5-5 provides the unique population ID, total number of individuals, and approximate size in square feet for each rose-flowered larkspur population. Refer to Map 5-4 for the location of each population. Appendix G provides photographs of rose-flowered larkspur and typical habitat in the study area. Appendix H provides the California Native Species Field Survey Forms that were submitted to CNDDB.[3]

No other SSPs were observed. Refer to Appendix I for a list of all plants (including mosses) observed in the study area during the early season surveys.

5.4 NON-NATIVE INVASIVE PLANTS

Appendix J provides the refined list of 38 target NNIPs for the Project.

Five target NNIP species were identified during early season (April 2024) and late season (June/July 2025) botanical surveys in the study area, including:

- Red brome (*Bromus madritensis*) (Cal-IPC High) – 24 populations totaling approximately 499.4 acres.
- Cheatgrass (*Bromus tectorum*) (Cal-IPC High) – 10 populations totaling approximately 1.9 acre.
- Scotch thistle (*Onopordum acanthium*) (Cal-IPC High) – 34 populations totaling approximately 2.7 acres.
- Rabbitsfoot grass (*Polypogon monspeliensis*) (Cal-IPC Limited) – 18 populations totaling approximately 5.2 acre.
- Common mullein (*Verbascum thapsus*) (Cal-IPC Limited) – 17 populations totaling approximately 5.5 acres.

Table 5-6 provides a summary of the NNIP populations mapped within the study area including scientific name, common name, unique population ID, facility, level of infestation, and population size (in square feet). The location and extent of each NNIP

[3] Note that, based on guidance provided by CNDDB, populations located within 0.25 mile of each other should be reported on the same California Native Species Field Survey Form. Therefore, the three populations located along the Conduit No. 3 Trail have been included on one form.

population is depicted on Map 5-5. Photographs of representative NNIP populations are also provided in Appendix K.

6.0 STUDY SPECIFIC CONSULTATION

The following study specific consultations have been conducted:

- **March 28, 2024:** SCE's consultant e-mailed the Terrestrial TWG to obtain resource agency input on reference population surveys and the timing of early season botanical surveys described in the TERR 1 TSP, and to request the most recent lists of SSPs and NNIPs for the SQF. No responses were received.

- **April 16, 2024:** SCE's consultant e-mailed the Terrestrial TWG providing the results of early season reference population surveys and to confirm timing of botanical surveys. No responses were received.

- **July 8, 2024:** SCE's consultant e-mailed the Terrestrial TWG to obtain resource agency input on reference population surveys and the timing of late season botanical surveys described in the TERR 1 TSP. No responses were received.

- **July 18, 2024:** SCE's consultant e-mailed the Terrestrial TWG providing the results of late season reference population surveys and to confirm timing of botanical surveys. No responses were received.

- **August 29, 2024:** SCE's consultant e-mailed the Terrestrial TWG regarding postponement of late season surveys due to the ignition of the Borel Fire and associated area evacuations, road closures and public safety concerns. An acknowledgment was received from Anna Bonnette, SQF Botanist.

- **June 9, 2025:** SCE's consultant e-mailed the Terrestrial TWG to obtain resource agency input on reference population surveys and the timing of late season botanical surveys described in the TERR 1 TSP. No responses were received.

- **June 25, 2025:** SCE's consultant e-mailed the Terrestrial TWG providing the results of late season reference population surveys and to confirm timing of botanical surveys. No responses were received.

7.0 OUTSTANDING STUDY PLAN ELEMENTS

There are no outstanding study plan elements. The TERR 1 – Botanical Resources Study is complete.

8.0 REFERENCES

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TABLES

Table 3-1. Kern River No. 1 Hydroelectric Project Facilities

Diversion Dam
Democrat Dam
Impoundment
Democrat Dam Impoundment
Water Conveyance System
Sandbox
Tunnels, Flumes, Conduits, and Adits
Forebay
Forebay Overflow Spillway
Penstock
Powerhouse and Switchyard
Kern River No. 1 Powerhouse and Switchyard
Project Access Roads
Willow Spring Creek Road (also referred to as Democrat Dam Road)
Powerline Road
Flume No. 1 Road
Dougherty Creek Road
Stark Creek Road
Forebay Operations Area Road
Lower Powerhouse Road
Upper Powerhouse Road
Project Access Trails
Democrat Gage Trail[1]
Conduit No. 3 Trail
Cow Flat Creek Trail
Steel Flume Trail[2]
Lucas Creek Trail
Dougherty Creek Trail
Stark Creek Trail[2]
Adit 17 & 18 Trail[3]
Overflow Spillway Trail[3]
Skip Hoist / Forebay Trail[3]
Aerial Cable Upper Access Trail[2,3]
Communication and Power Lines
Intake Gatehouse to Flume No. 1 Powerline
Powerhouse to Forebay Communication / Powerline
Gages and Stilling Wells
Kern River near Democrat Springs (USGS Gage No. 11192500 / SCE Gage No. 409)
Kern River No. 1 Conduit near Democrat Springs (USGS Gage No. 11192000 / SCE Gage No. 410)

Kern River near Democrat Springs (USGS Gage No. 11192501; calculated 11192500+11192000)
Stilling Well No. 1
Stilling Well No. 2
Ancillary and Support Facilities
Democrat Dam Area
Buoy Line in Democrat Dam Impoundment
Democrat Dam Intake Gatehouse
Democrat Dam Drainage Tower
Democrat Dam Drainage Tunnel
Democrat Dam Drainage Tunnel Outlet
Democrat Dam Access Walkway
Sandbox Drainage Channel
Gaging Cableway
Water Conveyance
Flume No. 6 Access Platform
Forebay Operations Area
Old Admin Building
Garage No. 1
Garage No. 2
Old Ice House
Water Tank
Aerial Cable Tower
Skip Hoist House and Lower Landing
Skip Hoist Cables and Cart
Skip Hoist Upper Landing
Skip Hoist Upper Landing to Forebay Catwalk
Communication Site
Forebay Operations Area Perimeter Fence
Forebay Perimeter Fence
Powerhouse Area
Machine Shop
Office / Lunchroom
Restroom
Powerhouse and Switchyard Perimeter Fence

Notes: [1] Entirety of trail is outside the FERC Project boundary.
[2] A portion of the trail is outside the FERC Project boundary.
[3] Aerial Cable Upper Access Trail was not identified as a trail in the PAD. Consultation with SCE staff in 2024 confirmed that this trail is used for operation and maintenance.

Key: SCE = Southern California Edison
USGS = U.S. Geological Survey

Table 5-1. Kern River Bypass Reach Segments and Associated Cross-Sectional Transects

Stream Segment Location (Refer to Figure 5-1)	River Mile Start	Transect Nos. in Segment	Elevation (feet)	Gradient (%)
Segment 1	43.9	KT1, KT2	924	2.5
Segment 2	47	KT3, KT4, KT5	1,330	1.1
Segment 3	49.5	KT 6, KT7, KT8	1,470	1.8
Segment 4	52.9	KT9, KT10	1,798	1.0

Table 5-2. Summary of Riparian Data Collected at Riparian Transects

Transect Number	Plot Number	Woody Riparian Trees/Shrubs			Herbaceous/ Graminoid Plants		Substrates Present
		Total Percent Cover	Species Richness	Age Class Structure[1]	Total Percent Cover	Species Richness	
KT1[2]	KT1-1	110	2	Y, O	10	2	Boulder, Cobble, Gravel, Sand, Silt
KT2[2]	KT2-1	88	2	Y, M, O	1	1	Sand
	KT2-2	102	2	Y, M	7	3	Bedrock, Boulder, Cobble, Gravel, Sand, Silt
KT3[2]	KT3-1	90	1	Y	28	6	Boulder, Cobble, Sand
KT4	KT4-1	109	2	O	1	1	Boulder, Cobble, Sand
	KT4-2	36	3	Y, O	4	3	Boulder, Cobble, Gravel, Sand
KT5	KT5-1	40	2	Y, M	79	3	Boulder, Sand, Silt
	KT5-2	85	2	M, O	73	10	Bedrock, Cobble, Gravel, Sand, Silt
KT6[2]	KT6-1	46	3	O	76	10	Boulder, Gravel, Sand
KT7	KT7-1	98	1	O	35	1	Boulder
	KT7-2	35	2	M, O	31	5	Boulder, Gravel, Sand
KT8	KT8-1	99	2	M, O	0	0	Boulder, Cobble, Sand, Silt
	KT8-2	18	2	M, O	112	7	Boulder, Sand
KT9	KT9-1	25	1	M	4	8	Boulder, Sand, Silt
	KT9-2	0	0	NA	109	5	Boulder, Sand
KT10	KT10-1	100	1	O	<1	1	Boulder, Cobble, Gravel, Sand
	KT10-2	90	2	Y, O	40	2	Boulder, Gravel, Sand
	KT10-3	40	1	O	35	10	Bedrock, Boulder, Gravel, Sand

Notes: [1] Age class structure was determined based on categories or shrub stem densities per individual and tree diameters, as follows:

- Young (Y): Shrubs with less than 10 stems per individual or trees with DBH less than 3 inches
- Medium-aged (M): Shrubs with between 10 and 60 stems per individual or trees with dbhs between 3 and 9 inches
- Old/Mature (O): Shrubs with more than 60 stems per individual or trees with dbhs greater than 9 inches

[2] No plots were established on far side of river due to high flows.

Key: NA = not applicable

Table 5-3. Dominant Woody Riparian Tree and Shrub Species Observed at Riparian Transects

Species		NWI Indicator Status[1]	Riparian Transect (X = plant present at transect)									
Scientific Name	**Common Name**		**KT1**	**KT2**	**KT3**	**KT4**	**KT5**	**KT6**	**KT7**	**KT8**	**KT9**	**KT10**
Baccharis salicifolia	Mule-fat	FACW	X	X		X		X	X			
Cephalanthus occidentalis	Common buttonbush	OBL	X	X	X	X	X	X		X		
Nicotiana glauca	Tree tobacco	FAC				X						
Platanus racemosa	California sycamore	FACW	X		X		X	X	X		X	X
Populus fremontii	Fremont cottonwood	FAC+						X				
Quercus wislizeni	Interior live oak	NI				X		X				X
Salix exigua	Narrowleaf willow	FACW		X	X							
Salix gooddingii	Goodding's willow	FACW		X								
Salix laevigata	Red willow	FACW+					X			X		X
Solanum americanum	American black nightshade	FAC		X						X		
Toxicodendron diversilobum	Pacific poison oak	NI								X		
Total Number of Species			**3**	**5**	**3**	**4**	**3**	**5**	**2**	**4**	**1**	**3**

Notes: [1] NWI Wetland Indicator Status as per the National Wetland Plant List (U.S. Army Corps of Engineers 2020)
Key: FAC = Equally likely to occur in wetlands and non-wetlands
FACU = Usually occur in non-wetlands but occasionally found in wetlands
FACW = Usually occur in wetlands but occasionally found in non-wetlands
NI = Not included on the National Wetland Plant List.
NWI = National Wetland Inventory
OBL = Obligate wetland species only found in wetlands
UPL = Upland species not likely to occur in wetlands

Table 5-4. Riparian/Wetland Herbaceous and Graminoid Plants Observed at Riparian Transects

Species		NWI Indicator Status[1]	Riparian Transect (X = plant present at transect)									
Scientific Name	**Common Name**		**KT1**	**KT2**	**KT3**	**KT4**	**KT5**	**KT6**	**KT7**	**KT8**	**KT9**	**KT10**
Artemisia douglasiana	Douglas' sagewort	FAC+						X	X	X		
Avena barbata	Slender oat	NI					X					
Bromus diandrus	Ripgut brome[2]	NI					X					X
Carex lenticularis	Lakeshore sedge	OBL					X	X		X		
Cynodon dactylon	Bermudagrass	FACU			X						X	
cyperus eragrostis	Tall flatsedge	FACW					X					X
Datura wrightii	Sacred thorn-apple	NI		X		X		X			X	
Epilobium canum	Hummingbird trumpet	NI					X					X
Epilobium ciliatum	Fringed willowherb	FACW								X		
Erigeron canadensis	Canadian horseweed	NI		X	X		X	X	X		X	X
Euthamia occidentalis	Western goldentop	OBL		X						X		
Gnaphalium palustre	Western marsh cudweed	FACW			X	X						
Helenium puberulum	Rosilla	FACW						X				
Juncus	Unknown juncus	NI	X									
Juncus balticus	Mountain rush	FACW+					X					
Juncus mexicanus	Mexican rush	FACW			X							
Medicago lupulina	Black medick	FAC	X		X			X			X	
Melilotus albus	sweetclover	NI										X
Onopordum acanthium	Scotch cottonthistle	NI						X				

Species		NWI Indicator Status[1]	Riparian Transect (X = plant present at transect)									
Scientific Name	**Common Name**		**KT1**	**KT2**	**KT3**	**KT4**	**KT5**	**KT6**	**KT7**	**KT8**	**KT9**	**KT10**
Persicaria hydropiperoides	Swamp smartweed	NI	X	X	X		X	X		X	X	X
Phacelia egena	Kaweah River phacelia	NI									X	X
Polypogon maritimus	Mediterranean rabbitsfoot grass	OBL					X	X			X	X
Pseudognaphalium luteoalbum	Jersey cudweed	NI						X			X	X
Rumex crispus L.	Curly dock	FACW-						X				
Setaria parviflora	Marsh bristlegrass	FAC		X	X		X		X		X	X
Setaria viridis	Green bristlegrass	NI									X	
Solidago californica	California goldenrod	NI		X								
Urtica dioica	Stinging nettle	FACU				X	X			X		
Verbascum thapsus	Common mullein, Woolly mullein	NI		X				X	X			X
Xanthium strumarium	Rough cocklebur	FAC+					X			X		
Unknown plant	Unknown plant[3]	NI				X						
Poaceae	Unknown grass	NI							X		X	X
Total Number of Species			**3**	**7**	**7**	**4**	**12**	**12**	**5**	**7**	**11**	**12**

Notes: [1] NWI Wetland Indicator Status as per the National Wetland Plant List (U.S. Army Corps of Engineers 2020)
[2] This species is included on the Sequoia National Forest list of non-native invasive plant species dated November 2025.
[3] Plant lacked sufficient features to allow for identification.

Key: FAC = Equally likely to occur in wetlands and non-wetlands.
FACU = Usually occur in non-wetlands but occasionally found in wetlands
FACW = Usually occur in wetlands but occasionally found in non-wetlands.
NI = Not included on the National Wetland Plant List.
OBL = Obligate wetland species only found in wetlands.
UPL = Upland species not likely to occur in wetlands.

Table 5-5. Special-Status Plant Populations Identified During Botanical Surveys in the Study Area

Scientific Name	Final Map ID	Facility	Total Number of Individuals	Population Size (Square Feet)	Survey Date
Rose-flowered larkspur *(Delphinium purpusii)* Forest Service Species of Conservation Concern; California Rare Plant Rank 1B.3	DEPU_01	Conduit No. 3 Trail	35	75	4/26/2024
	DEPU_02	Conduit No. 3 Trail	17	40	4/26/2024
	DEPU_03	Conduit No. 3 Trail	16	60	4/26/2024
	DEPU_04	Flume No. 3	25	1,000	4/28/2024
	DEPU_05	Lucas Creek Trail	7	250	4/28/2024
	DEPU_06	Stark Creek Trail	1	1	4/27/2024
	DEPU_07	Dougherty Creek Trail	1	1	4/27/2024
	DEPU_08	Adit 14 & 15	12	150	4/29/2024
	DEPU_09	Overflow Spillway Trail	320	1,800	4/25/2024
Totals			**434**	**3,377**	

Notes: [1] Refer to Map 5-4 (Appendix A) for the location of each population in the Study Area.

Table 5-6. Non-Native Invasive Plant Populations Identified During Botanical Surveys in the Study Area

Final Map ID[1]	Facility	Level of Infestation[2]	Population Size (Square Feet)
Red brome *(Bromus madritensis ssp. rubens)* – Cal-IPC High			
BRMA_01	Kern River No. 1 Powerhouse and Switchyard	Mod	1,445,321
BRMA_02	Adit 17 & 18 Trail	Mod	202,000
BRMA_03	Adit 17 & 18 Trail	Mod	25,000
BRMA_04	Adit 18 & 19	Mod	10,000
BRMA_05	Adit 14 & 15	Mod	10,000
BRMA_06	Stark Creek Road	Mod	225,000
BRMA_07	Adit 12 & 13	Mod	10,000
BRMA_08	Stark Creek Road	Mod	0
BRMA_09	Lucas Creek Trail	Mod	68,233
BRMA_10	Flume No. 4 Lucas Creek	Mod	9,000
BRMA_11	Steel Flume Trail	Mod	24,812
BRMA_12	Conduit No. 6	Mod	5,600
BRMA_13	Steel Flume Trail	Mod	26,300
BRMA_14	Cow Flat Creek Trail	Mod	34,500
BRMA_15	Adit 4 & 5	Mod	10,000
BRMA_16	Conduit No. 3 Trail	Mod	31,268
BRMA_17	Adit 2 & 3	Mod	5,000
BRMA_18	Democrat Gauge Trail	Mod	76,879
BRMA_19	Flume No. 1	Low	105,074
BRMA_20	Powerline Road	Mod	19,828
BRMA_21	Willow Spring Creek Road (also referred to as Democrat Dam Road)	Mod	17,978,220
BRMA_22	Democrat Dam Impoundment	Low	742,231
BRMA_23	Democrat Dam Impoundment	Low	621,348
ONAC_BRTE_BRMA_ POMO_VETH_01[3]	Democrat Dam Impoundment	Mod	70,000
		Total Size	**21,755,614 sq ft (499.4 acres)**
Cheatgrass *(Bromus tectorum)* – Cal-IPC High			
BRTE_01	Stark Creek Road	Low	3,000
BRTE_02	Stark Creek Road	Low	450
BRTE_03	Dougherty Creek Road	Low	600
BRTE_04	Dougherty Creek Trail	Low	25

Final Map ID[1]	Facility	Level of Infestation[2]	Population Size (Square Feet)
BRTE_05	Democrat Gage Trail	Low	75
BRTE_06	Willow Spring Creek Road (also referred to as Democrat Dam Road)	Low	1
BRTE_07	Democrat Gage Trail	Low	10,000
BRTE_08	Willow Spring Creek Road (also referred to as Democrat Dam Road)	Low	30
BRTE_09	Democrat Dam Impoundment	Low	5
ONAC_BRTE_BRMA_POMO_VETH_01[3]	Democrat Dam Impoundment	Low	70,000
		Total Size	**84,186 sq ft (1.9 acres)**
Scotch thistle *(Onopordum acanthium)* – Cal-IPC High			
ONAC_01	Forebay Operations Area Road	Low	750
ONAC_02	Water Tank	Low	200
ONAC_03	Kern River No. 1 Powerhouse and Switchyard	Mod	1,000
ONAC_04	Forebay Overflow Spillway	Low	1
ONAC_05	Overflow Spillway Trail	Low	20
ONAC_06	Overflow Spillway Trail	Low	4
ONAC_07	Forebay Overflow Spillway	Low	1
ONAC_08	Overflow Spillway Trail	Low	400
ONAC_09	Overflow Spillway Trail	Low	1
ONAC_10	Stark Creek Trail	Low	300
ONAC_11	Stark Creek Trail	Low	100
ONAC_12	Stark Creek Road	Low	1
ONAC_13	Stark Creek Road	Low	1
ONAC_14	Stark Creek Road	Low	400
ONAC_16	Steel Flume Trail	Low	4
ONAC_17	Steel Flume Trail	Low	100
ONAC_18	Cow Flat Creek Trail	Low	1
ONAC_19	Adit 4 & 5	Low	100
ONAC_20	MIF Release Point	Low	1500
ONAC_21	Flume No. 1	Low	9
ONAC_22	Flume No. 1	Low	43,560
ONAC_23	Flume No. 1	Low	4
ONAC_24	Flume No. 1	Low	20
ONAC_25	Flume No. 1 Powerline	Low	25
ONAC_26	Democrat Dam Impoundment	Low	6

Final Map ID[1]	Facility	Level of Infestation[2]	Population Size (Square Feet)
ONAC_28	Willow Spring Creek Road (also referred to as Democrat Dam Road)	Low	25
ONAC_29	Democrat Dam Impoundment	Low	1
ONAC_30	Democrat Dam Impoundment	Low	200
ONAC_31	Democrat Dam Impoundment	Low	1
ONAC_32	Democrat Dam Impoundment	Low	300
ONAC_33	Democrat Dam Impoundment	Low	2
ONAC_34	Democrat Dam Impoundment	Low	2
ONAC_35	Democrat Dam Impoundment	Low	2
ONAC_36	Kern River No. 1 Powerhouse and Switchyard	Low	4
ONAC_37	Kern River No. 1 Powerhouse and Switchyard	Low	2
ONAC_BRTE_BRMA_ POMO_VETH_01[3]	Democrat Dam Impoundment	Low	70,000
		Total Size	**119,049 sq ft (2.7 acres)**
Rabbitsfoot grass *(Polypogon monspeliensis)* – Cal-IPC Limited			
POMO_01	Kern River No. 1 Powerhouse and Switchyard	Low	150
POMO_02	Kern River No. 1 Powerhouse and Switchyard	Low	100
POMO_03	Democrat Dam Impoundment	Mod	400
POMO_04	Democrat Dam Impoundment	Low	30
POMO_05	Democrat Dam Impoundment	Low	225
POMO_06	Democrat Dam Impoundment	Low	180
POMO_07	Democrat Dam Impoundment	Low	4000
POMO_08	Democrat Dam Impoundment	Low	100
POMO_09	Democrat Dam Impoundment	Low	60
POMO_10	Democrat Dam Impoundment	Low	660
POMO_11	Democrat Dam Impoundment	Low	100
POMO_12	Democrat Dam Impoundment	Low	160
POMO_13	Democrat Dam Impoundment	Low	2
POMO_14	Dougherty Creek Trail	Low	120
POMO_15	Kern River No. 1 Powerhouse and Switchyard	Low	160
POMO_VETH_01[4]	Democrat Dam Impoundment	Mod	75,000
POMO_VETH_02[4]	Democrat Dam Impoundment	Low	75,000
POMO_VETH_03[4]	Democrat Dam Impoundment	Mod	360
POMO_VETH_04[4]	Democrat Dam Impoundment	Low	1000

Final Map ID[1]	Facility	Level of Infestation[2]	Population Size (Square Feet)
ONAC_BRTE_BRMA_ POMO_VETH_01[3]	Democrat Dam Impoundment	Low	70,000
		Total Size	**227,807 sq ft (5.2 acre)**
Common mullein *(Verbascum thapsus)* – Cal-IPC Limited			
VETH_01	Democrat Gage Trail	Mod	1,200
VETH_02	Democrat Dam Impoundment	Low	50
VETH_03	Democrat Dam Impoundment	Low	90
VETH_04	Democrat Dam Impoundment	Low	25
POMO_VETH_01[4]	Democrat Dam Impoundment	Mod	75,000
POMO_VETH_02[4]	Democrat Dam Impoundment	Low	75,000
VETH_07	Democrat Dam Impoundment	Low	100
VETH_08	Democrat Dam Impoundment	Low	16
VETH_09	Democrat Dam Impoundment	Low	16
VETH_10	Democrat Dam Impoundment	Low	660
VETH_12	Democrat Dam Impoundment	Low	400
VETH_13	Democrat Dam Impoundment	Mod	360
VETH_14	Democrat Dam Impoundment	Low	40
VETH_15	Democrat Dam Impoundment	Low	6
POMO_VETH_03[4]	Democrat Dam Impoundment	Mod	15,000
POMO_VETH_04[4]	Democrat Dam Impoundment	Low	1000
ONAC_BRTE_BRMA_ POMO_VETH_01[3]	Democrat Dam Impoundment	Low	70,000
		Total Size	**238,963 sq ft (5.5 acres)**

Notes: [1] Refer to Map 5-5 for the location of each individual/population in the Study Area.
[2] Level of Infestation
[3] The polygon represents a population comprising five NNIP species. While the original field ID was designated as ONAC_27, it has since been updated to consolidate all species within a single polygon.
[4] This population includes both POMO and VETH groups within a single polygon. While the original polygons had distinct field IDs, these have been modified to form compiled polygons

Key: Cal-IPC = California Invasive Plant Council
Low = <5% cover
Mod = 6–25% cover
High = >25% cover
sq ft = square feet

FIGURES

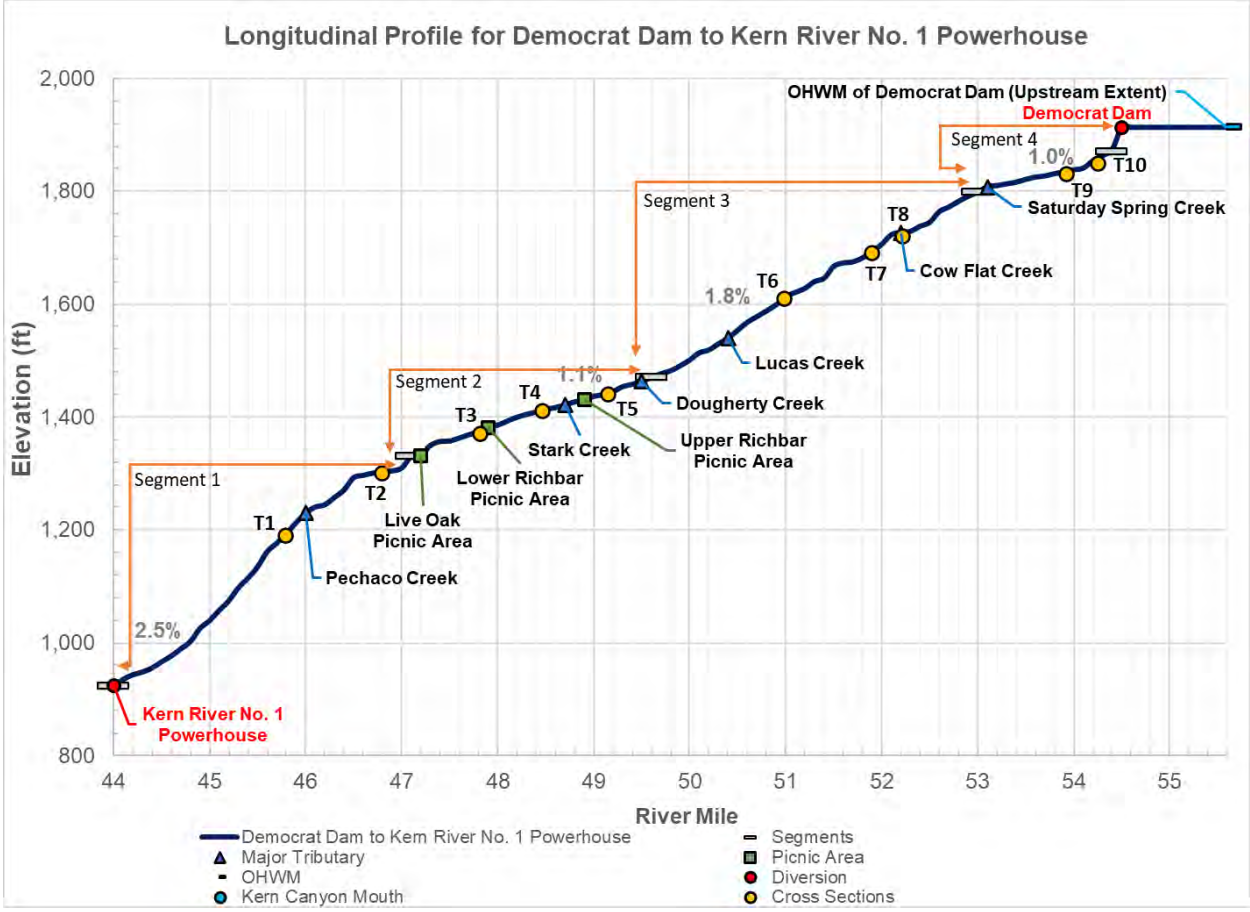


Figure 5-1. Transect Locations (i.e., Cross Sections) at Representative Elevations along the Kern River Bypass Reach.

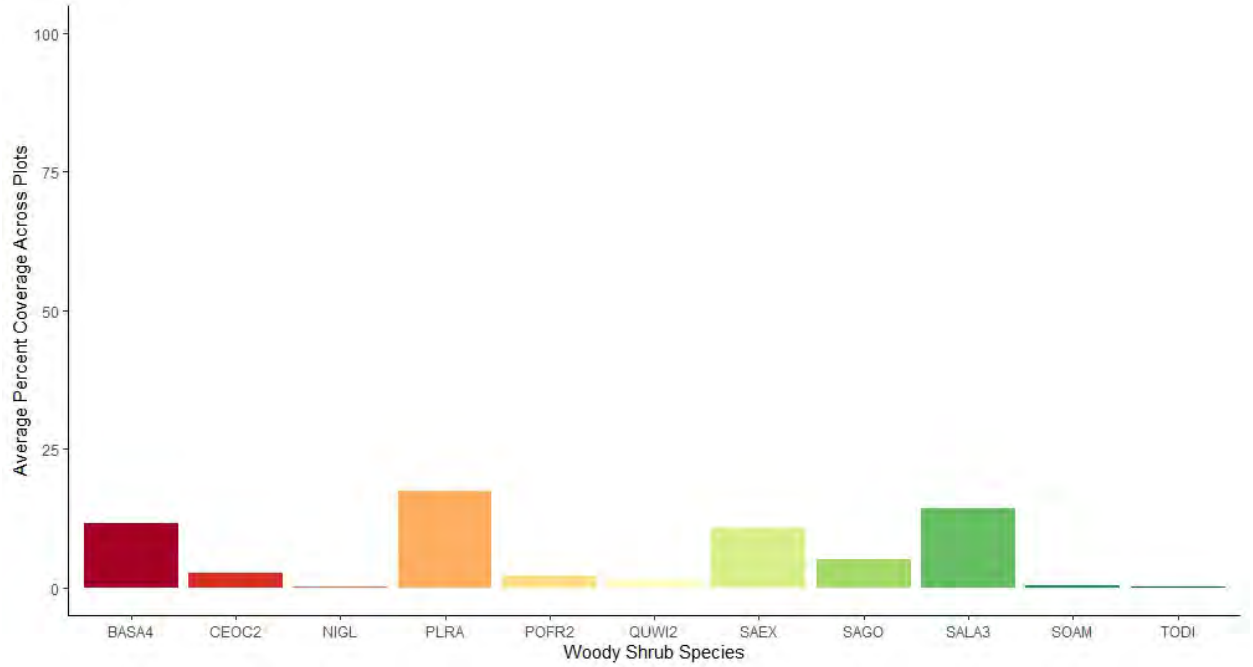


Figure 5-2. Average Percent Cover of Woody Species at Riparian Transects.

Species Codes: BASA4 = *Baccharis salicifolia*, CEOC2 = *Cephalanthus occidentalis*, NIGL = *Nicotiana glauca*, PLRA = *Platanus racemosa*, POFR2 = *Populus fremontii*, QUWI2 = *Quercus wislizeni*, SAEX = *Salix exigua*, SAGO = *Salix gooddingii*, SALA3 = *Salix laevigata*, SOAM = *Solanum americanum*, TODI = *Toxicodendron diversilobum*

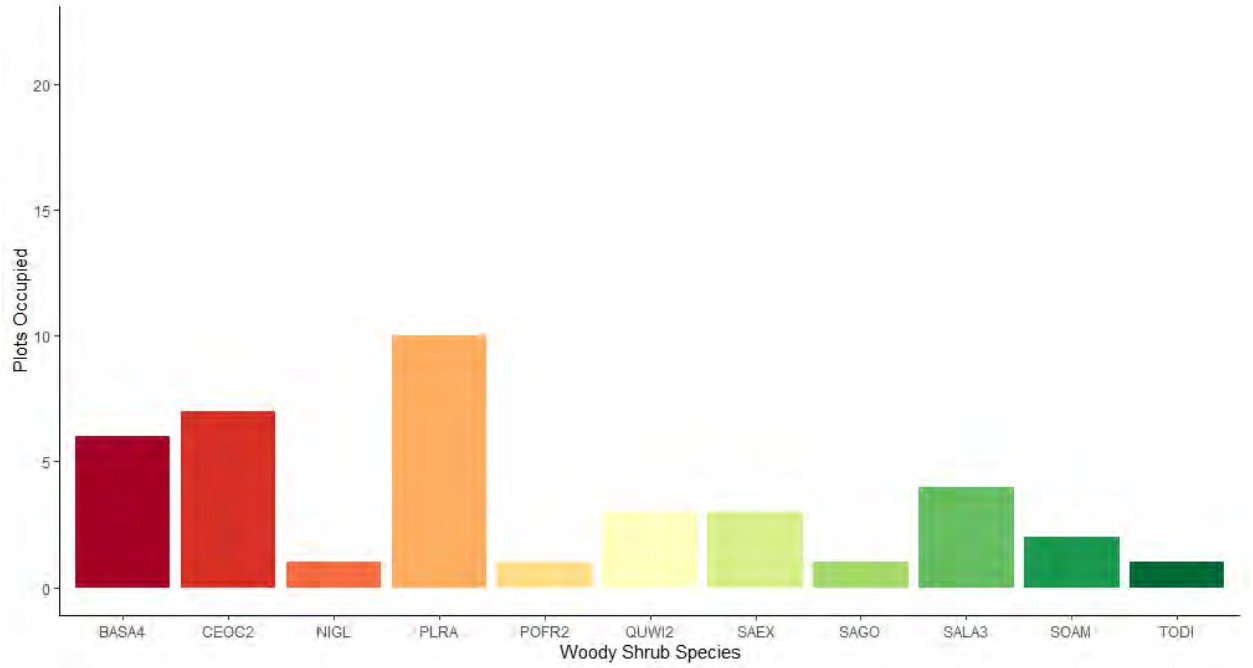


Figure 5-3. Frequency of Occurrence of Woody Species at Riparian Transects.

Species Codes: BASA4 = *Baccharis salicifolia*, CEOC2 = *Cephalanthus occidentalis*, NIGL = *Nicotiana glauca*, PLRA = *Platanus racemosa*, POFR2 = *Populus fremontii*, QUWI2 = *Quercus wislizeni*, SAEX = *Salix exigua*, SAGO = *Salix gooddingii*, SALA3 = *Salix laevigata*, SOAM = *Solanum americanum*, TODI = *Toxicodendron diversilobum*

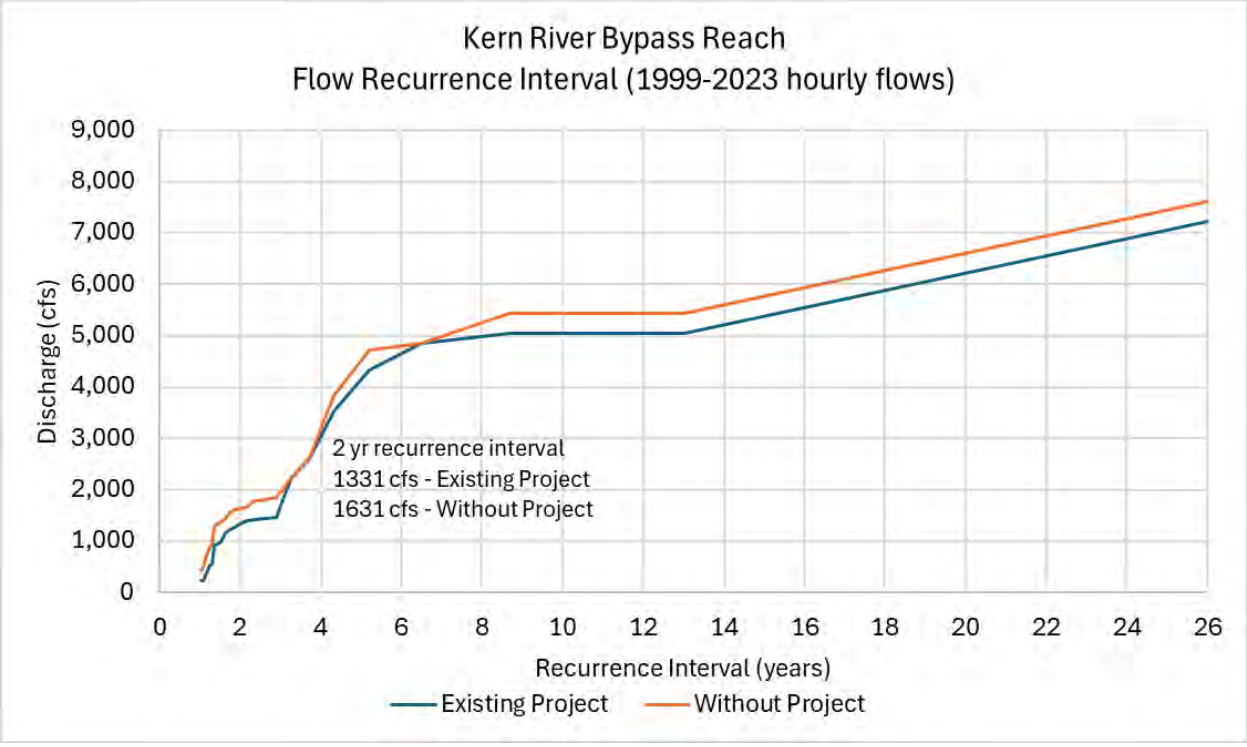
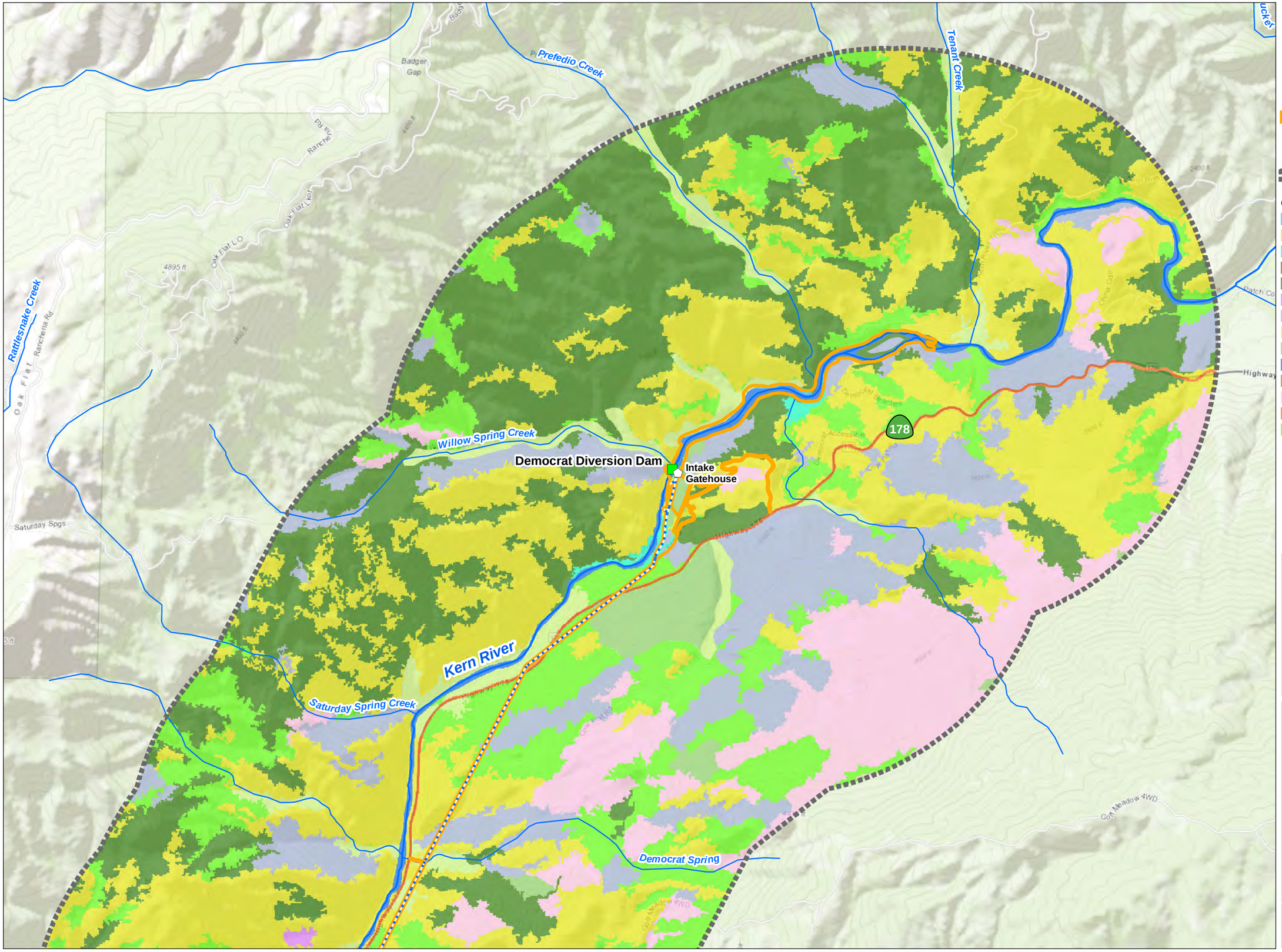


Figure 5-4. Flow recurrence interval for Existing Project and Without-Project Hydrology (1990–2023 average hourly flows).

MAPS



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Flowline
- Penstock
- FERC Boundary

Other Features

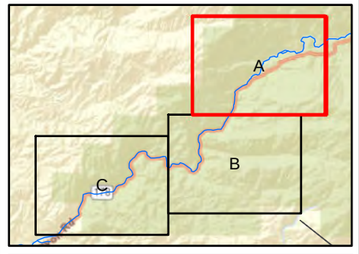
- Watercourse
- 1 Mile Buffer of FERC Boundary

CALVEG Vegetation Alliances*

- Agriculture Pond or Water Feature (A7)
- Annual Grasses and Forbs Alliance (HG)
- Baccharis (Riparian) Alliance (ML)
- Barren (BA)
- Blue Oak Alliance (QD)
- California Sycamore (QP)
- Gray Pine Alliance (PD)
- Interior Live Oak (QW)
- Interior Mixed Hardwood Alliance (NX)
- River/Stream/Canal (W1)
- Tilled Earth (A3)
- Ultramafic Mixed Shrub Alliance (C1)
- Urban-related Bare Soil (IB)
- Valley Oak Alliance (QL)

NOTE: Where terrain was visible with binoculars, biologists identified most QL polygons as being dominated by Quercus wislizeni (QW). We have changed polygons we were able to visually confirm, but it is quite likely remaining QL polygons are actually QW.

*SOURCE: Adapted from Existing Vegetation - CALVEG, USDA - FS, Region 5 - Central Valley, 2019



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

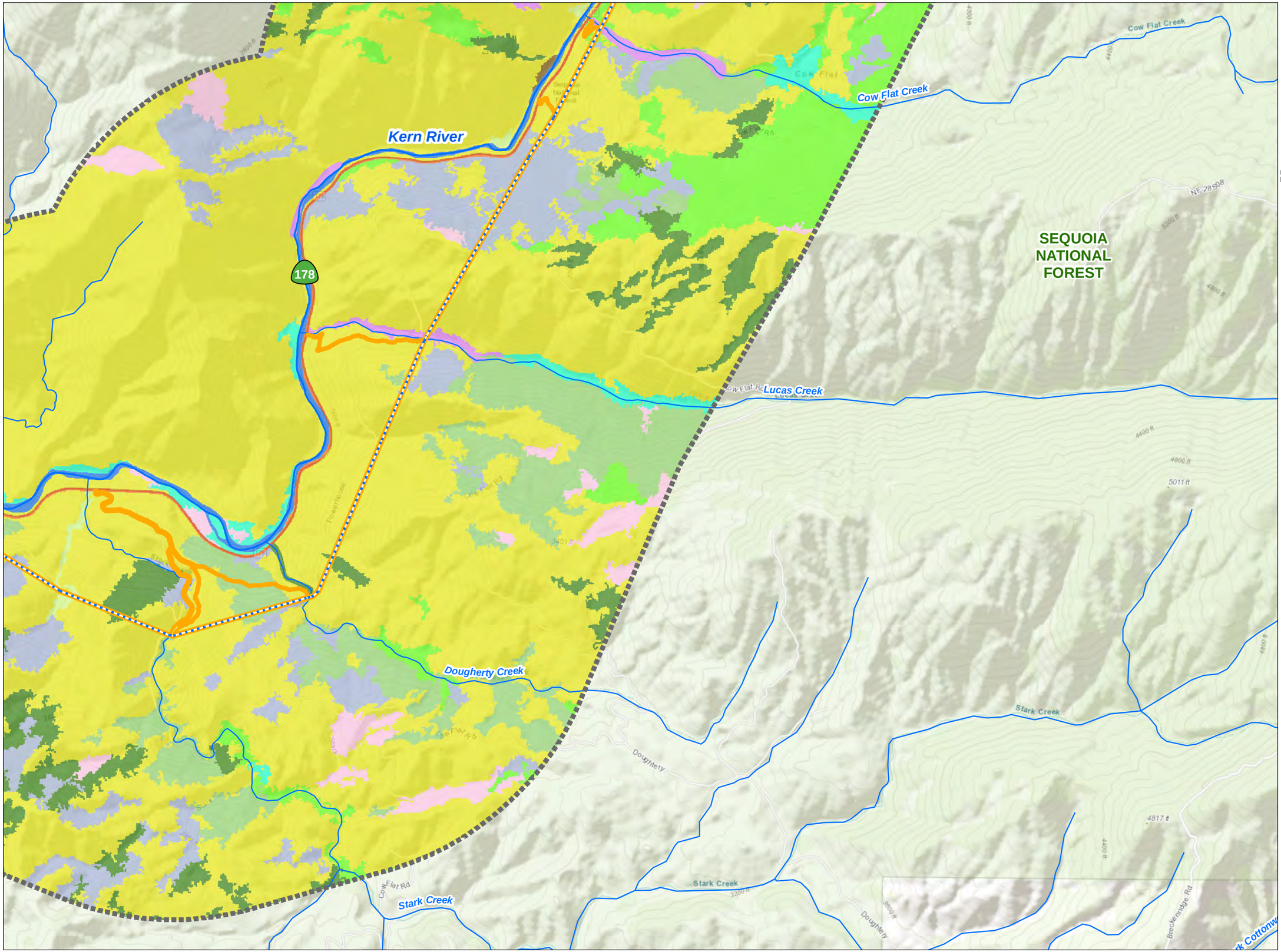
Map 5-1A

Vegetation Alliances within 1 Mile Around Kern No. 1 Project Facilities

Date: 1/4/2025

0 0.125 0.25 Miles

Projection: UTM Zone 11
Datum: NAD 83



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Flowline
- Penstock
- FERC Boundary

Other Features

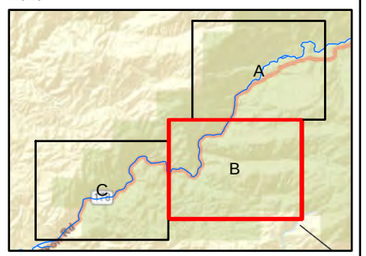
- Watercourse
- 1 Mile Buffer of FERC Boundary

CALVEG Vegetation Alliances*

- Agriculture Pond or Water Feature (A7)
- Annual Grasses and Forbs Alliance (HG)
- Baccharis (Riparian) Alliance (ML)
- Barren (BA)
- Blue Oak Alliance (QD)
- California Sycamore (QP)
- Gray Pine Alliance (PD)
- Interior Live Oak (QW)
- Interior Mixed Hardwood Alliance (NX)
- River/Stream/Canal (W1)
- Tilled Earth (A3)
- Ultramafic Mixed Shrub Alliance (C1)
- Urban-related Bare Soil (IB)
- Valley Oak Alliance (QL)

NOTE: Where terrain was visible with binoculars, biologists identified most QL polygons as being dominated by Quercus wislizeni (QW). We have changed polygons we were able to visually confirm, but it is quite likely remaining QL polygons are actually QW.

*SOURCE: Adapted from Existing Vegetation - CALVEG, USDA - FS, Region 5 - Central Valley, 2019



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-1B

Vegetation Alliances within 1 Mile Around Kern No. 1 Project Facilities

Date: 1/4/2025

0 0.125 0.25 Miles

Projection: UTM Zone 11
Datum: NAD 83

Kern River No. 1 Powerhouse
Forebay
Penstock
rose-flowered larkspur
178
Pechacho Creek
Sequoia National Forest

Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Flowline
- Penstock
- FERC Boundary

Other Features

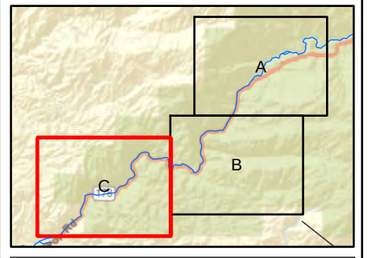
- Watercourse
- 1 Mile Buffer of FERC Boundary

CALVEG Vegetation Alliances*

- Agriculture Pond or Water Feature (A7)
- Annual Grasses and Forbs Alliance (HG)
- Baccharis (Riparian) Alliance (ML)
- Barren (BA)
- Blue Oak Alliance (QD)
- California Sycamore (QP)
- Gray Pine Alliance (PD)
- Interior Live Oak (QW)
- Interior Mixed Hardwood Alliance (NX)
- River/Stream/Canal (W1)
- Tilled Earth (A3)
- Ultramafic Mixed Shrub Alliance (C1)
- Urban-related Bare Soil (IB)
- Valley Oak Alliance (QL)

NOTE: Where terrain was visible with binoculars, biologists identified most QL polygons as being dominated by Quercus wislizeni (QW). We have changed polygons we were able to visually confirm, but it is quite likely remaining QL polygons are actually QW.

*SOURCE: Adapted from Existing Vegetation - CALVEG, USDA - FS, Region 5 - Central Valley, 2019



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

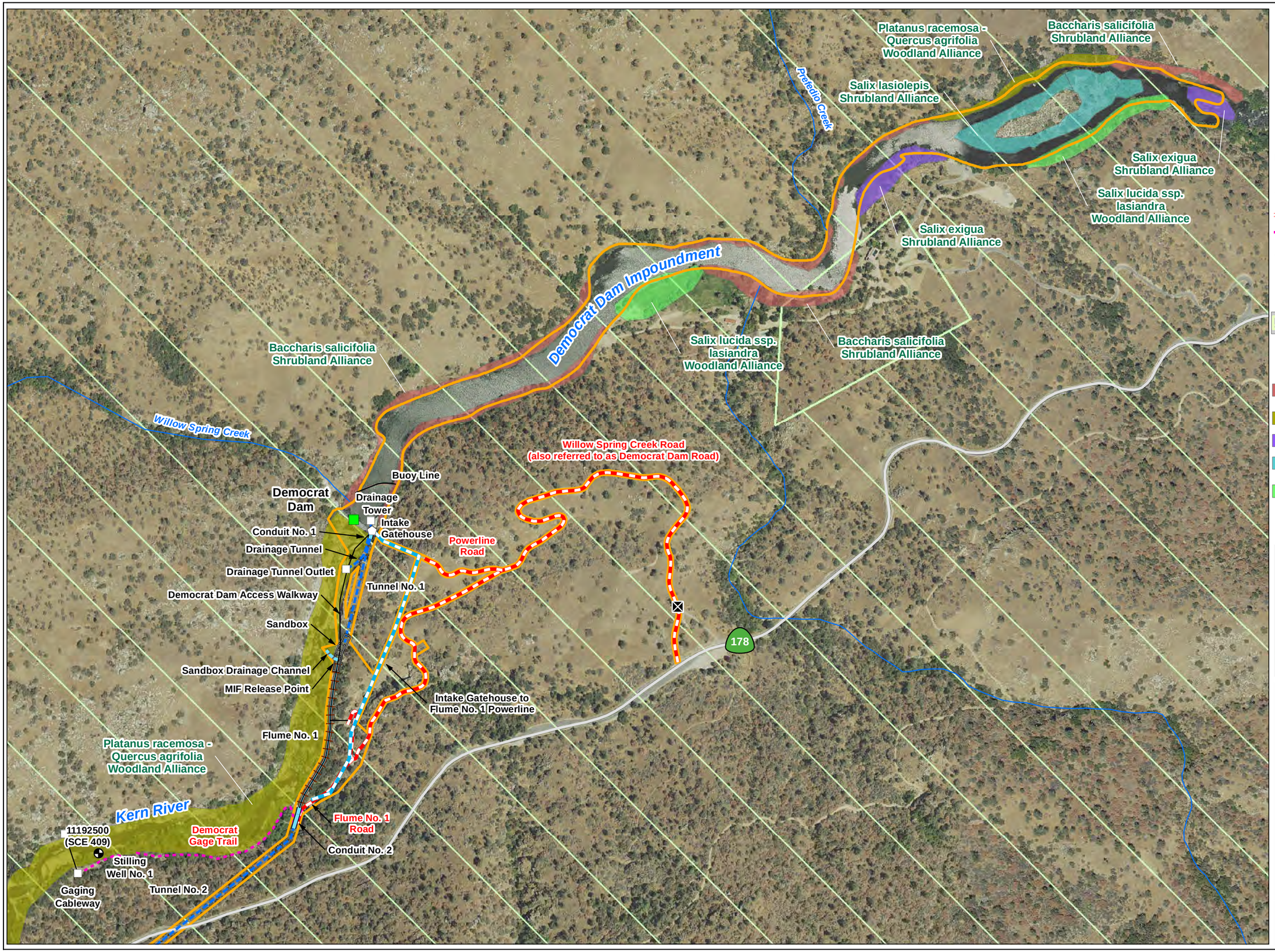
Map 5-1C

Vegetation Alliances within 1 Mile Around Kern No. 1 Project Facilities

Date: 1/4/2025

0 0.125 0.25 Miles

Projection: UTM Zone 11
Datum: NAD 83



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication/ Powerline
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road
- Gate

Other Features

- Watercourse

Land Jurisdiction*

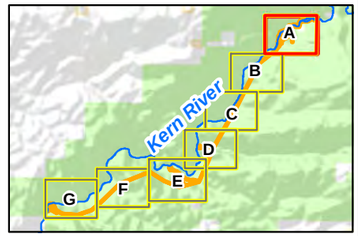
- U.S. Forest Service

*SOURCE: BLM 2021

Riparian Alliances

- Baccharis salicifolia Shrubland Alliance
- Platanus racemosa - Quercus agrifolia Woodland Alliance
- Salix exigua Shrubland Alliance
- Salix lasiolepis Shrubland Alliance
- Salix lucida ssp. lasiandra Woodland Alliance

Note: Other than Democrat Dam Impoundment and the Kern River, there were no Special Aquatic Features in the Study Area



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-2A

Riparian Alliances and Special Aquatic Features Within the FERC Project Boundary, Along Project Access Trails, and Along the Kern No. 1 Project Bypass Reach.

0 250 500
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 10/30/2025

Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication/ Powerline
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road
- Gate

Other Features

- Watercourse

Land Jurisdiction*

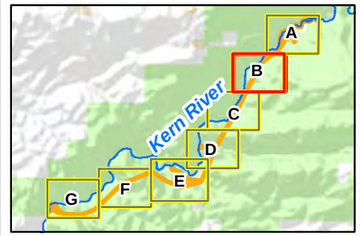
- U.S. Forest Service

*SOURCE: BLM 2021

Riparian Alliances

- Baccharis salicifolia Shrubland Alliance
- Platanus racemosa - Quercus agrifolia Woodland Alliance
- Salix exigua Shrubland Alliance
- Salix lasiolepis Shrubland Alliance
- Salix lucida ssp. lasiandra Woodland Alliance

Note: Other than Democrat Dam Impoundment and the Kern River, there were no Special Aquatic Features in the Study Area



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-2B

Riparian Alliances and Special Aquatic Features Within the FERC Project Boundary, Along Project Access Trails, and Along the Kern No. 1 Project Bypass Reach.

0 250 500
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 10/30/2025

Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication/ Powerline
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road
- Gate

Other Features

- Watercourse

Land Jurisdiction*

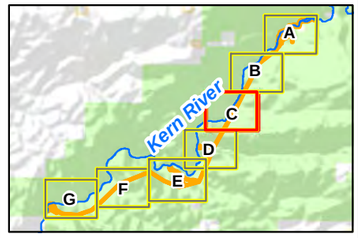
- U.S. Forest Service

*SOURCE: BLM 2021

Riparian Alliances

- Baccharis salicifolia Shrubland Alliance
- Platanus racemosa - Quercus agrifolia Woodland Alliance
- Salix exigua Shrubland Alliance
- Salix lasiolepis Shrubland Alliance
- Salix lucida ssp. lasiandra Woodland Alliance

Note: Other than Democrat Dam Impoundment and the Kern River, there were no Special Aquatic Features in the Study Area



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

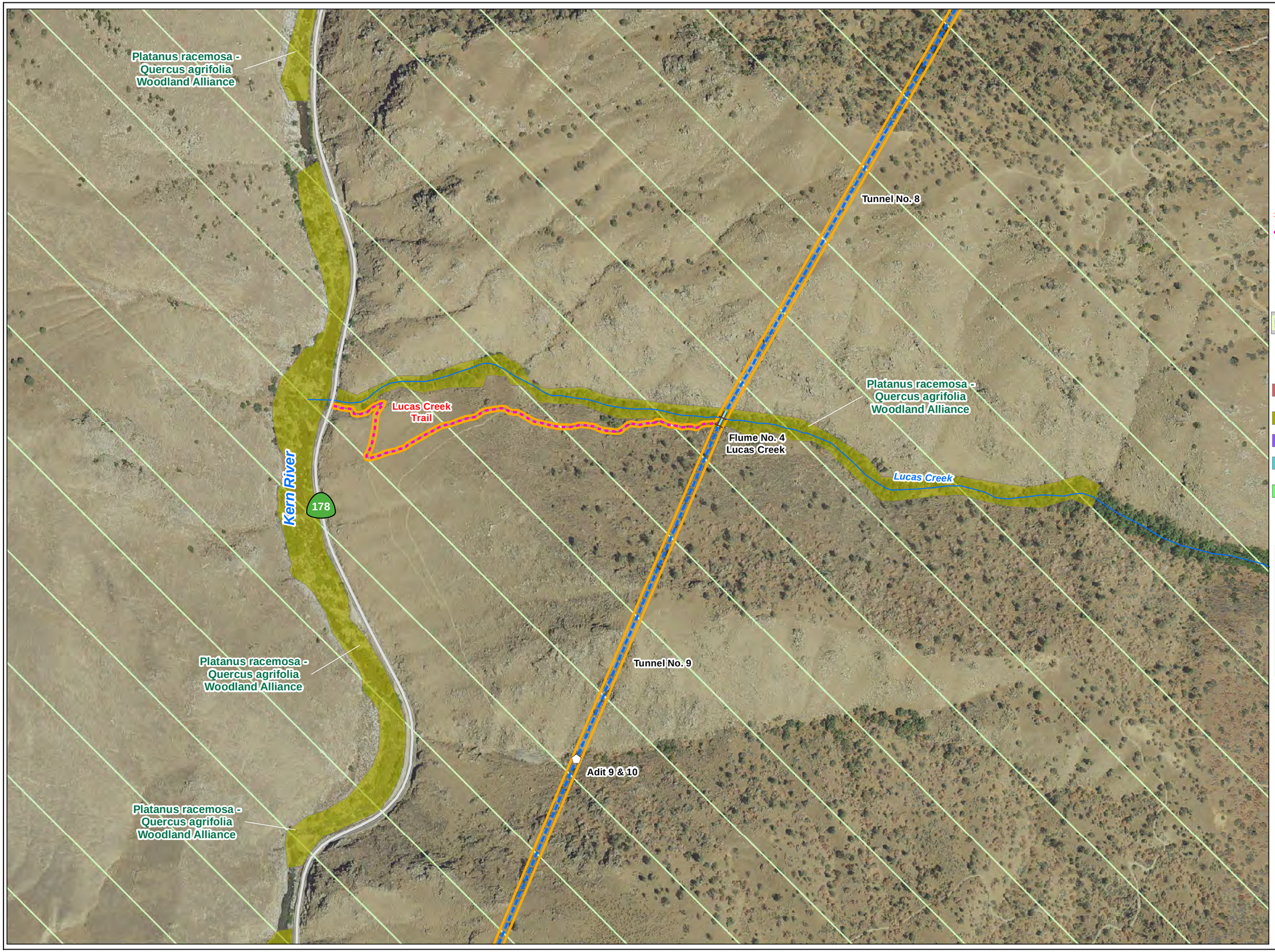
Map 5-2C

Riparian Alliances and Special Aquatic Features Within the FERC Project Boundary, Along Project Access Trails, and Along the Kern No. 1 Project Bypass Reach.

0 250 500
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 10/30/2025



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication/ Powerline
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road
- Gate

Other Features

- Watercourse

Land Jurisdiction*

- U.S. Forest Service

*SOURCE: BLM 2021

Riparian Alliances

- Baccharis salicifolia Shrubland Alliance
- Platanus racemosa - Quercus agrifolia Woodland Alliance
- Salix exigua Shrubland Alliance
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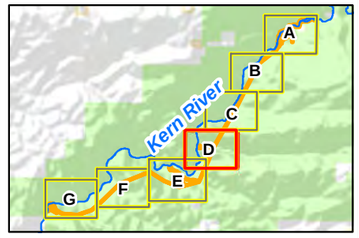


SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

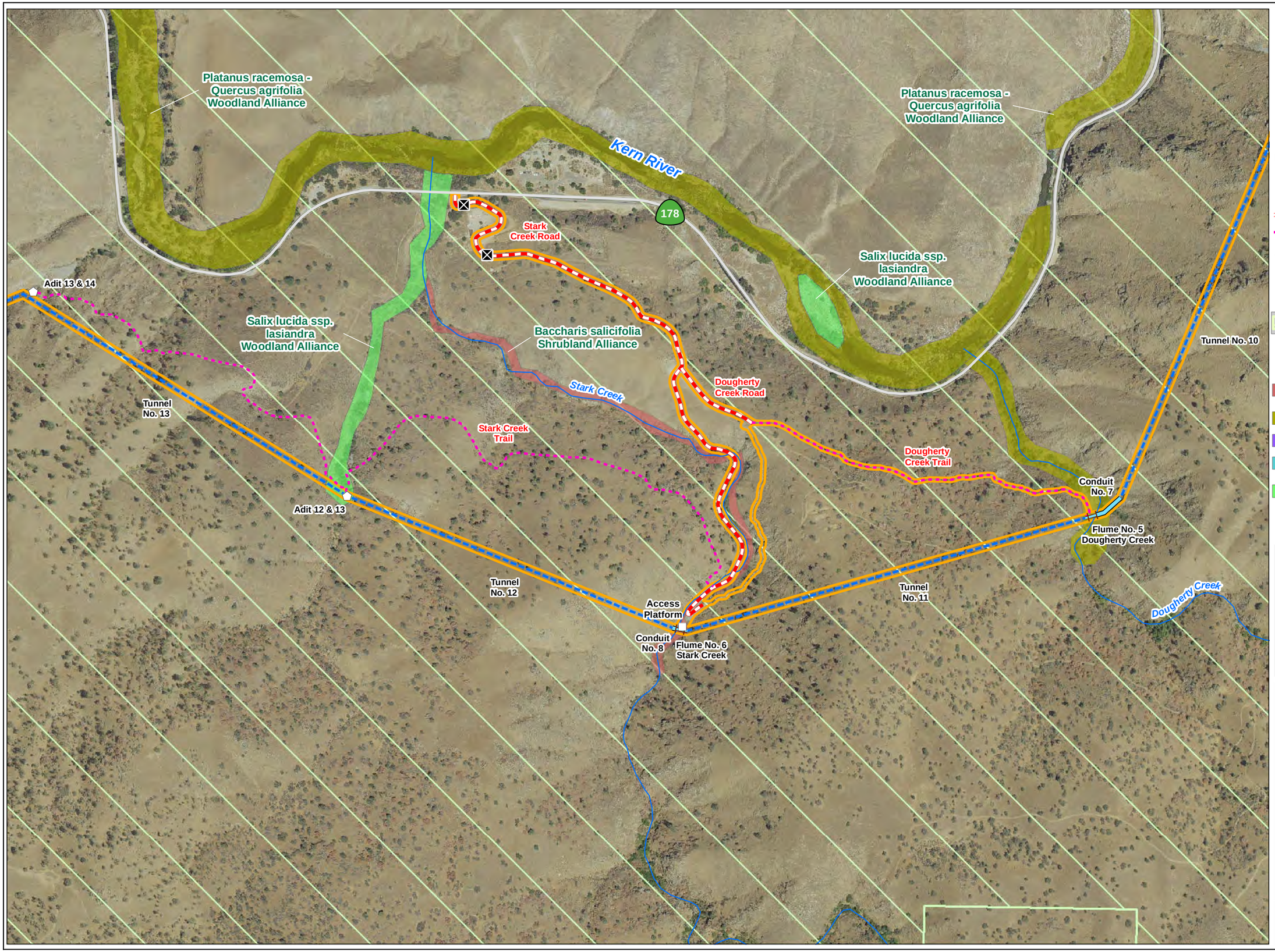
Map 5-2D

Riparian Alliances and Special Aquatic Features Within the FERC Project Boundary, Along Project Access Trails, and Along the Kern No. 1 Project Bypass Reach.

0 250 500
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 10/30/2025



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication/ Powerline
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road
- Gate

Other Features

- Watercourse

Land Jurisdiction*

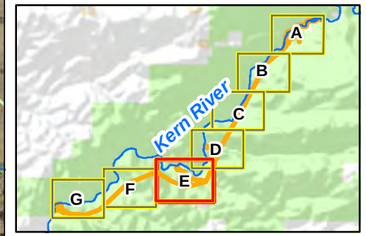
- U.S. Forest Service

*SOURCE: BLM 2021

Riparian Alliances

- Baccharis salicifolia Shrubland Alliance
- Platanus racemosa - Quercus agrifolia Woodland Alliance
- Salix exigua Shrubland Alliance
- Salix lasiolepis Shrubland Alliance
- Salix lucida ssp. lasiandra Woodland Alliance

Note: Other than Democrat Dam Impoundment and the Kern River, there were no Special Aquatic Features in the Study Area



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Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-2E

Riparian Alliances and Special Aquatic Features Within the FERC Project Boundary, Along Project Access Trails, and Along the Kern No. 1 Project Bypass Reach.

0 250 500
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 10/30/2025

Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication/ Powerline
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road
- Gate

Other Features

- Watercourse

Land Jurisdiction*

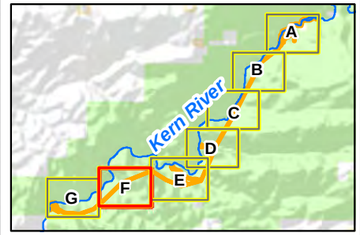
- U.S. Forest Service

*SOURCE: BLM 2021

Riparian Alliances

- Baccharis salicifolia Shrubland Alliance
- Platanus racemosa - Quercus agrifolia Woodland Alliance
- Salix exigua Shrubland Alliance
- Salix lasiolepis Shrubland Alliance
- Salix lucida ssp. lasiandra Woodland Alliance

Note: Other than Democrat Dam Impoundment and the Kern River, there were no Special Aquatic Features in the Study Area



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

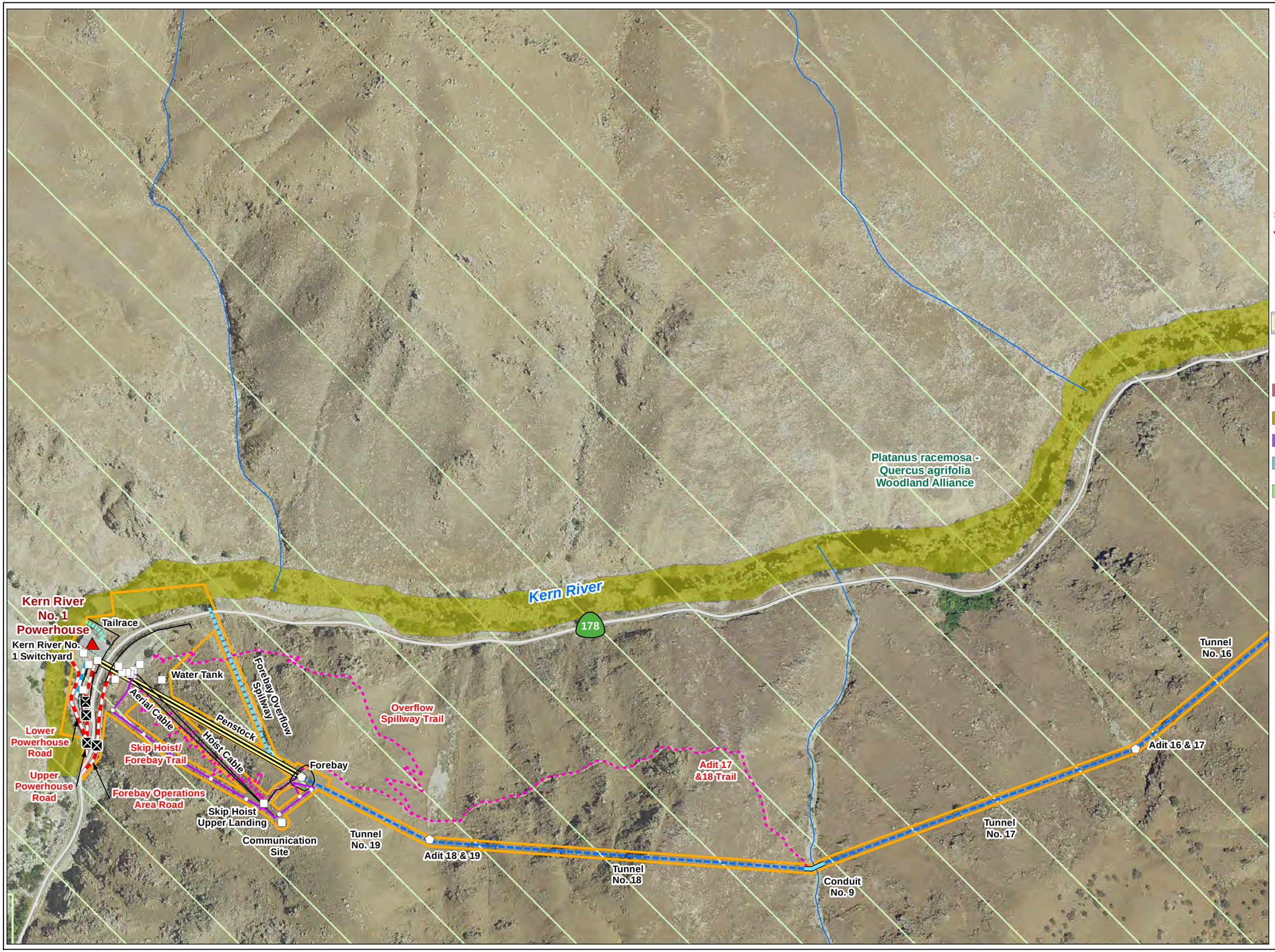
Map 5-2F

Riparian Alliances and Special Aquatic Features Within the FERC Project Boundary, Along Project Access Trails, and Along the Kern No. 1 Project Bypass Reach.

0 250 500
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 10/30/2025



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication/ Powerline
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road
- Gate

Other Features

- Watercourse

Land Jurisdiction*

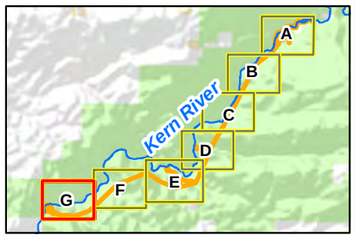
- U.S. Forest Service

*SOURCE: BLM 2021

Riparian Alliances

- Baccharis salicifolia Shrubland Alliance
- Platanus racemosa - Quercus agrifolia Woodland Alliance
- Salix exigua Shrubland Alliance
- Salix lasiolepis Shrubland Alliance
- Salix lucida ssp. lasiandra Woodland Alliance

Note: Other than Democrat Dam Impoundment and the Kern River, there were no Special Aquatic Features in the Study Area



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

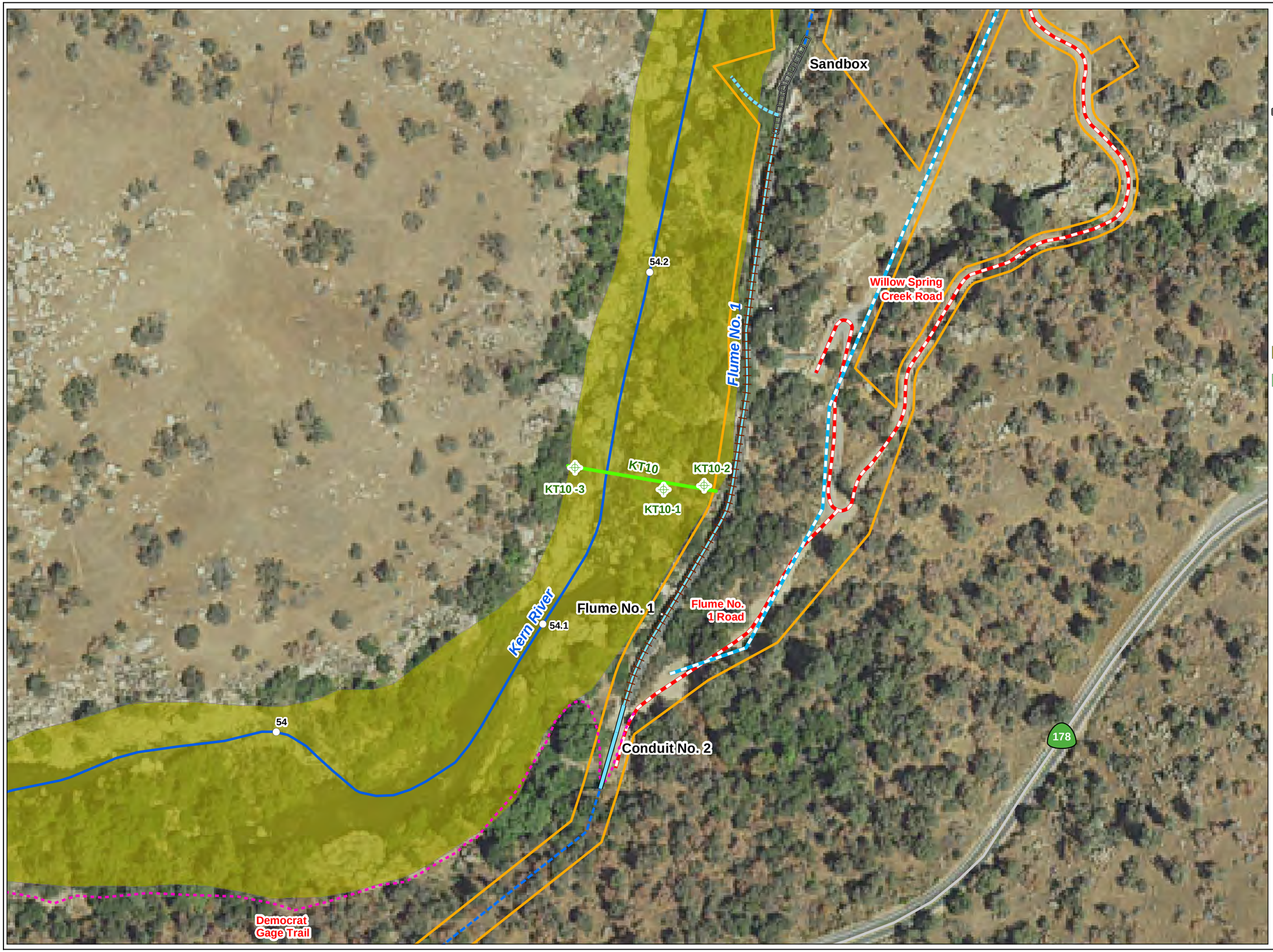
Map 5-2G

Riparian Alliances and Special Aquatic Features Within the FERC Project Boundary, Along Project Access Trails, and Along the Kern No. 1 Project Bypass Reach.

0 250 500
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 10/30/2025



Facilities

- Gage
- Ancillary Facility
- Conduit
- Spillway
- Flume
- Tailrace
- Powerline
- Tunnel
- Sandbox
- FERC Boundary

Transportation

- Project Road
- Other Road
- Project Trail

Other Features

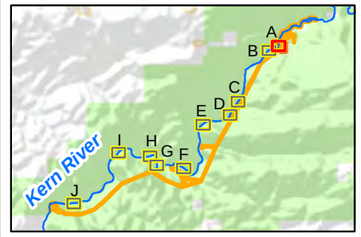
- River Mile (1/10th Mile)
- Watercourse

Transects/Sampling Plots

- Plots
- Transect

Riparian Alliances

- Platanus racemosa - Quercus agrifolia Woodland Alliance
- Salix lucida ssp. lasiandra Woodland Alliance



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Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-3A

Riparian Transects Along the Kern River No. 1 Project Bypass Reach

0 75 150
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 10/30/2025

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Facilities

- Gage
- Ancillary Facility
- Conduit
- Spillway
- Flume
- Tailrace
- Powerline
- Tunnel
- Sandbox
- FERC Boundary

Transportation

- Project Road
- Other Road
- Project Trail

Other Features

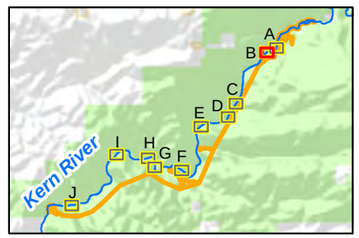
- River Mile (1/10th Mile)
- Watercourse

Transects/Sampling Plots

- Plots
- Transect

Riparian Alliances

- Platanus racemosa - Quercus agrifolia Woodland Alliance
- Salix lucida ssp. lasiandra Woodland Alliance



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-3B

Riparian Transects Along the Kern River No. 1 Project Bypass Reach

0 75 150
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 10/30/2025

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Facilities

- Gage
- Conduit
- Flume
- Powerline
- Sandbox
- Ancillary Facility
- Spillway
- Tailrace
- Tunnel
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road

Other Features

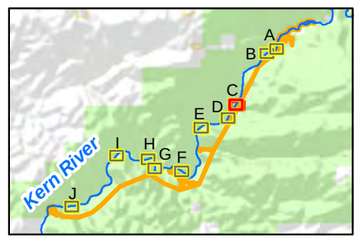
- River Mile (1/10th Mile)
- Watercourse

Transects/Sampling Plots

- Plots
- Transect

Riparian Alliances

- Platanus racemosa - Quercus agrifolia Woodland Alliance
- Salix lucida ssp. lasiandra Woodland Alliance



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-3C

Riparian Transects Along the Kern River No. 1 Project Bypass Reach

N
W E
S

0 75 150
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 10/30/2025

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Facilities

- Gage
- Conduit
- Flume
- Powerline
- Sandbox
- Ancillary Facility
- Spillway
- Tailrace
- Tunnel
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road

Other Features

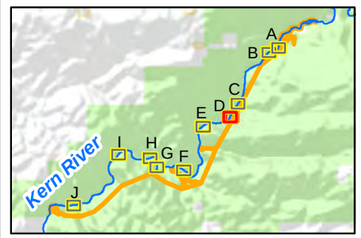
- River Mile (1/10th Mile)
- Watercourse

Transects/Sampling Plots

- Plots
- Transect

Riparian Alliances

- Platanus racemosa - Quercus agrifolia Woodland Alliance
- Salix lucida ssp. lasiandra Woodland Alliance



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-3D

Riparian Transects Along the Kern River No. 1 Project Bypass Reach

0 75 150
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 10/30/2025

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The Kern River flows during the time of the survey made crossing too dangerous; therefore, a plot was only taken on one side of the river.

Kern River

51

50.9

KT6

KT6-1

178

50.8

Facilities

- Gage
- Conduit
- Flume
- Powerline
- Sandbox
- Ancillary Facility
- Spillway
- Tailrace
- Tunnel
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road

Other Features

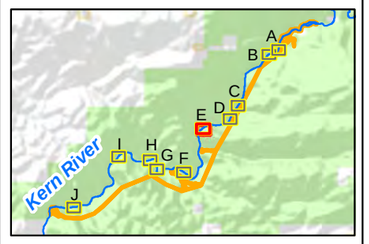
- River Mile (1/10th Mile)
- Watercourse

Transects/Sampling Plots

- Plots
- Transect

Riparian Alliances

- Platanus racemosa - Quercus agrifolia Woodland Alliance
- Salix lucida ssp. lasiandra Woodland Alliance



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead™

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-3E

Riparian Transects Along the Kern River No. 1 Project Bypass Reach

0 75 150
Feet

Date: 10/30/2025

Projection: UTM Zone 11
Datum: NAD 83

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Facilities

- Gage
- Conduit
- Flume
- Powerline
- Sandbox
- Ancillary Facility
- Spillway
- Tailrace
- Tunnel
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road

Other Features

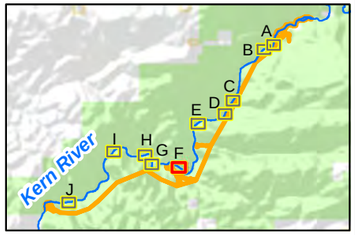
- River Mile (1/10th Mile)
- Watercourse

Transects/Sampling Plots

- Plots
- Transect

Riparian Alliances

- Platanus racemosa - Quercus agrifolia Woodland Alliance
- Salix lucida ssp. lasiandra Woodland Alliance



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-3F

Riparian Transects Along the Kern River No. 1 Project Bypass Reach

0 75 150
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 10/30/2025

Facilities

- Gage
- Conduit
- Flume
- Powerline
- Sandbox
- Ancillary Facility
- Spillway
- Tailrace
- Tunnel
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road

Other Features

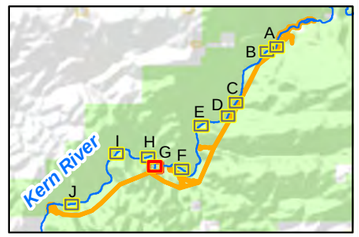
- River Mile (1/10th Mile)
- Watercourse

Transects/Sampling Plots

- Plots
- Transect

Riparian Alliances

- Platanus racemosa - Quercus agrifolia Woodland Alliance
- Salix lucida ssp. lasiandra Woodland Alliance



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-3G

Riparian Transects Along the Kern River No. 1 Project Bypass Reach

0 75 150
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 10/30/2025

C:\GIS\237800343\map\Kern River 1\TerrestrialMaps\BotanicalMaps\SCE_Kern1_RipCrTransects_17i11i_01.mxd

The Kern River flows during the time of the survey made crossing too dangerous; therefore, a plot was only taken on one side of the river.

Kern River

47.6

47.7

47.8

47.9

48

KT3

KT3-1

178

Facilities

- Gage
- Conduit
- Flume
- Powerline
- Sandbox
- Ancillary Facility
- Spillway
- Tailrace
- Tunnel
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road

Other Features

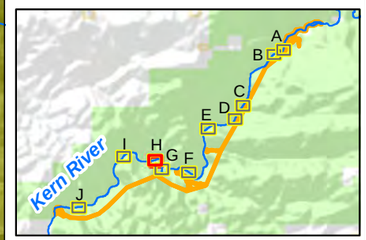
- River Mile (1/10th Mile)
- Watercourse

Transects/Sampling Plots

- Plots
- Transect

Riparian Alliances

- Platanus racemosa - Quercus agrifolia Woodland Alliance
- Salix lucida ssp. lasiandra Woodland Alliance



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-3H

Riparian Transects Along the Kern River No. 1 Project Bypass Reach

0 75 150
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 10/30/2025

C:\GIS\237800343\map\Kern River 1\TerrestrialMaps\BotanicalMaps\SCE_Kern1_RipCrTransects_17i11i_01.mxd

The Kern River flows during the time of the survey made crossing too dangerous; therefore, a plot was only taken on one side of the river.

Kern River

KT2

KT2-1

KT2-2

178

46.9

46.8

46.7

46.6

Facilities

- Gage
- Conduit
- Flume
- Powerline
- Sandbox
- Ancillary Facility
- Spillway
- Tailrace
- Tunnel
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road

Other Features

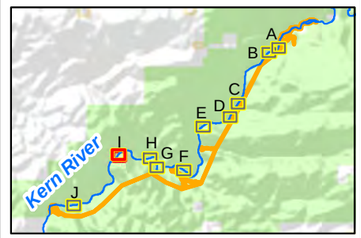
- River Mile (1/10th Mile)
- Watercourse

Transects/Sampling Plots

- Plots
- Transect

Riparian Alliances

- Platanus racemosa - Quercus agrifolia Woodland Alliance
- Salix lucida ssp. lasiandra Woodland Alliance



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Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-3I

Riparian Transects Along the Kern River No. 1 Project Bypass Reach

0 75 150
Feet

Date: 10/30/2025

Projection: UTM Zone 11
Datum: NAD 83

C:\GIS\237800343\map\Kern River 1\TerrestrialMaps\BotanicalMaps\SCE_Kern1_RipCrTransects_17i11i_01.mxd

The Kern River flows during the time of the survey made crossing too dangerous; therefore, a plot was only taken on one side of the river.

Kern River

KT1

KT1-1

44.4

44.5

44.6

44.7

178

Facilities

- Gage
- Ancillary Facility
- Conduit
- Spillway
- Flume
- Tailrace
- Powerline
- Tunnel
- Sandbox
- FERC Boundary

Transportation

- Project Road
- Other Road
- Project Trail

Other Features

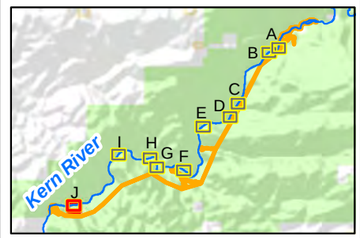
- River Mile (1/10th Mile)
- Watercourse

Transects/Sampling Plots

- Plots
- Transect

Riparian Alliances

- Platanus racemosa - Quercus agrifolia Woodland Alliance
- Salix lucida ssp. lasiandra Woodland Alliance



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-3J

Riparian Transects Along the Kern River No. 1 Project Bypass Reach

0 75 150
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 10/30/2025

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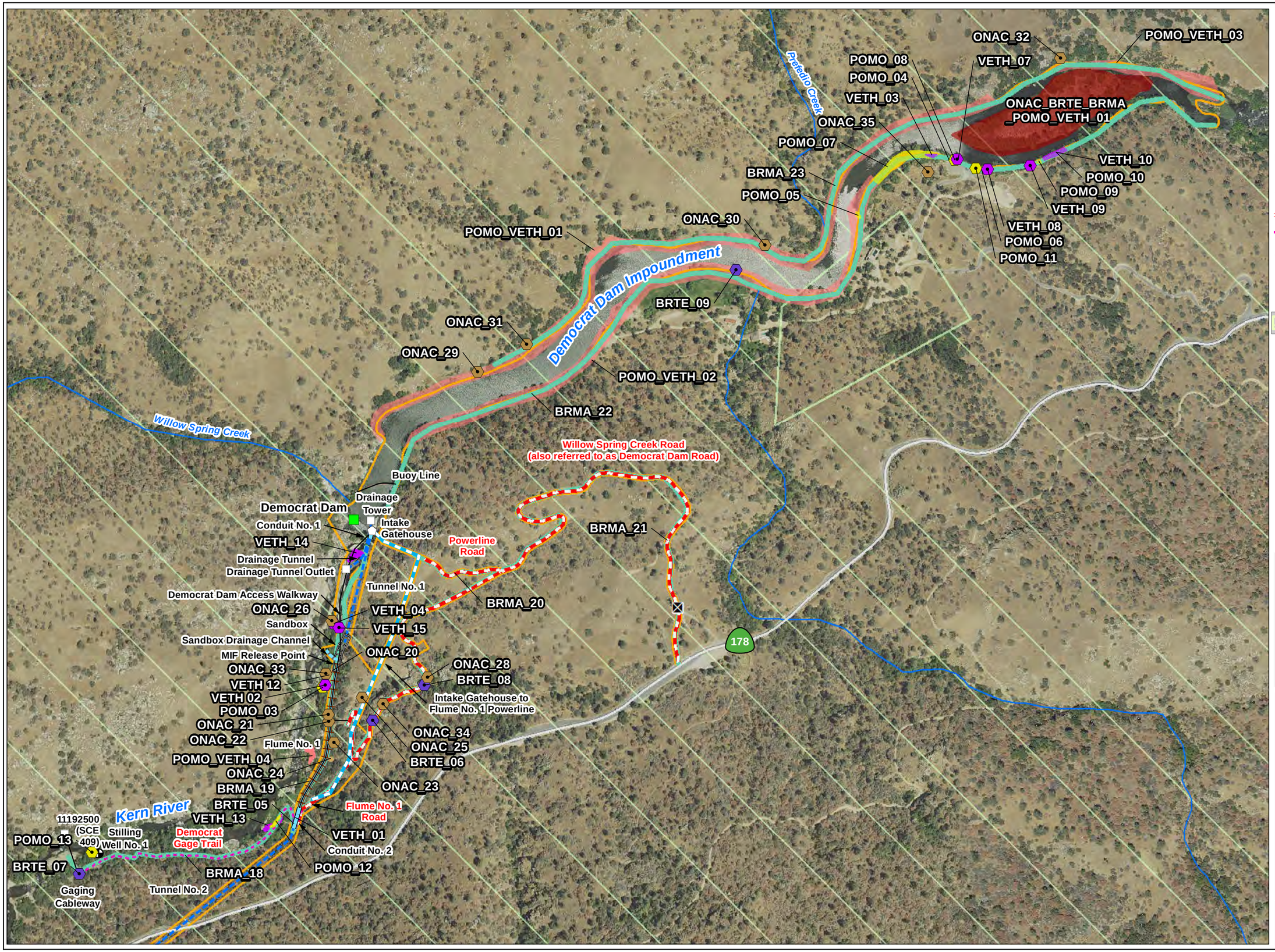
CONFIDENTIAL INFORMATION

The following map is being withheld from public disclosure in accordance with applicable regulations. It contains details on the locations of special-status biological resources and qualifies as Confidential Information (18 Code of Federal Regulations § 385.1112). Disclosure of such information could be harmful to these resources. To further understand FERC's regulations regarding confidential filings, visit: https://www.ferc.gov/foia.

Map 5-4a–g Special-Status Plants Within the FERC Project Boundary, Along Project Access Trails, and the Kern River No. 1 Project Bypass Reach (CONFIDENTIAL)

Map 5-4a–g will not be distributed to the general public. Documents containing Confidential Information may be requested by entities and organizations with jurisdiction over these resources. To request copies, please contact Kadi Whiteside, SCE Relicensing Project Manager at (626) 807-3641 / karen.whiteside@sce.com.



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication/ Powerline
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road
- Gate

Other Features

- Watercourse

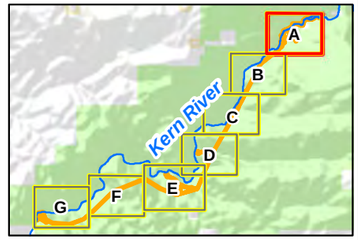
Land Jurisdiction*

- U.S. Forest Service

*SOURCE: BLM 2021

Non-Native Invasive Plants

- BRMAR, red brome
- BRTE, cheatgrass
- ONAC, scotch thistle
- POMO, rabbitsfoot grass
- VETH, common mullein
- POMO & VETH
- ONAC, BRTE, BRMAR, POMO & VETH



SOUTHERN CALIFORNIA EDISON
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Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

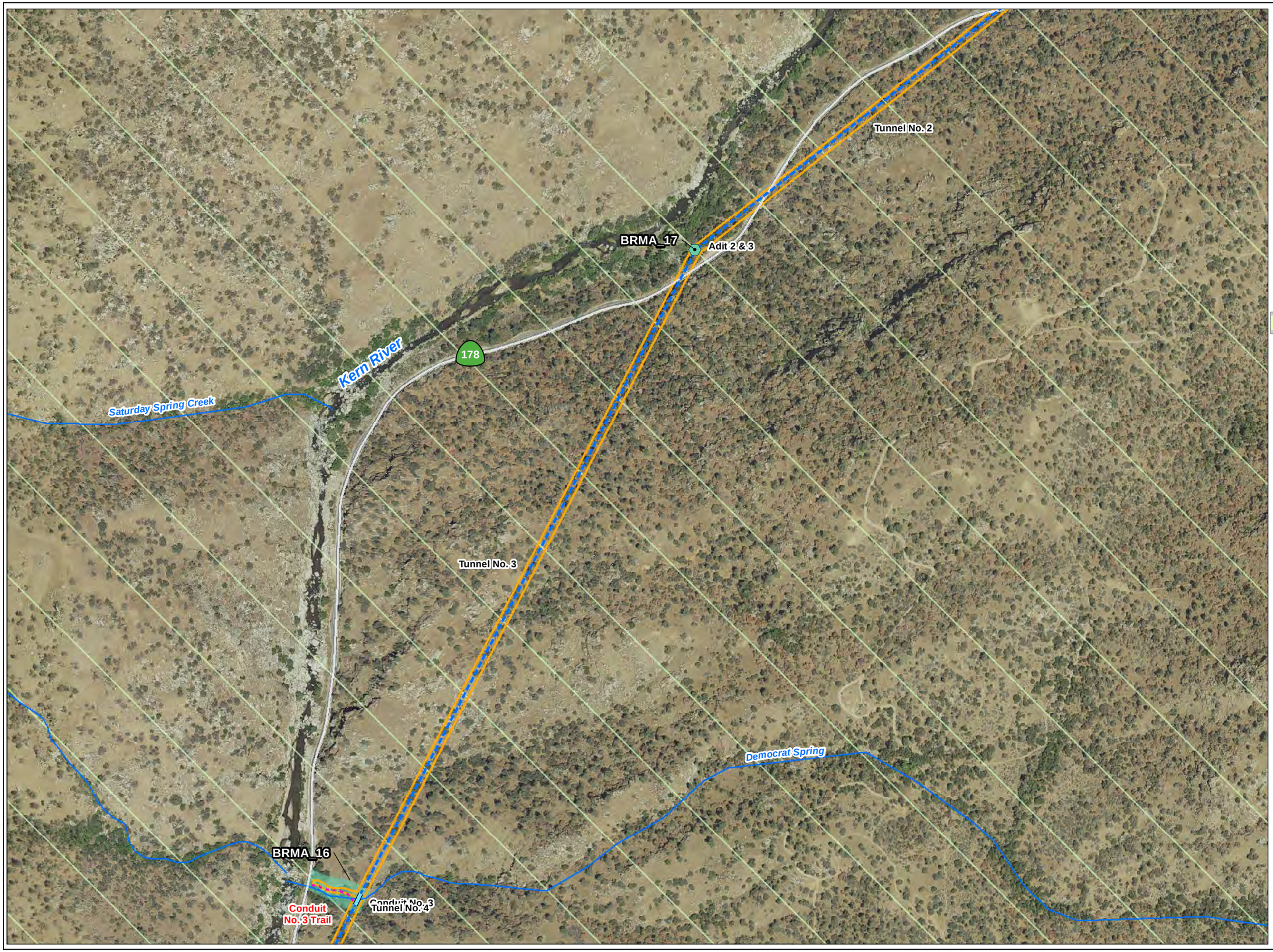
Map 5-5A

Non-Native Invasive Plants Within the FERC Project Boundary, Along Project Access Trails, and Along the Kern No. 1 Project Bypass Reach

0 250 500
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 10/30/2025



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication/ Powerline
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road
- Gate

Other Features

- Watercourse

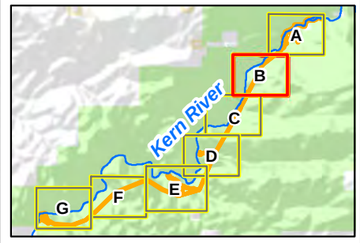
Land Jurisdiction*

- U.S. Forest Service

*SOURCE: BLM 2021

Non-Native Invasive Plants

- BRMAR, red brome
- BRTE, cheatgrass
- ONAC, scotch thistle
- POMO, rabbitsfoot grass
- VETH, common mullein
- POMO & VETH
- ONAC, BRTE, BRMAR, POMO & VETH



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Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-5B

Non-Native Invasive Plants Within the FERC Project Boundary, Along Project Access Trails, and Along the Kern No. 1 Project Bypass Reach

0 250 500
Feet

Date: 10/30/2025

Projection: UTM Zone 11
Datum: NAD 83

Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication/ Powerline
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road
- Gate

Other Features

- Watercourse

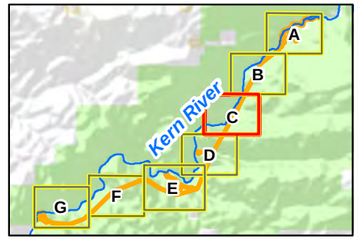
Land Jurisdiction*

- U.S. Forest Service

*SOURCE: BLM 2021

Non-Native Invasive Plants

- BRMAR, red brome
- BRTE, cheatgrass
- ONAC, scotch thistle
- POMO, rabbitsfoot grass
- VETH, common mullein
- POMO & VETH
- ONAC, BRTE, BRMAR, POMO & VETH



SOUTHERN CALIFORNIA EDISON
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Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

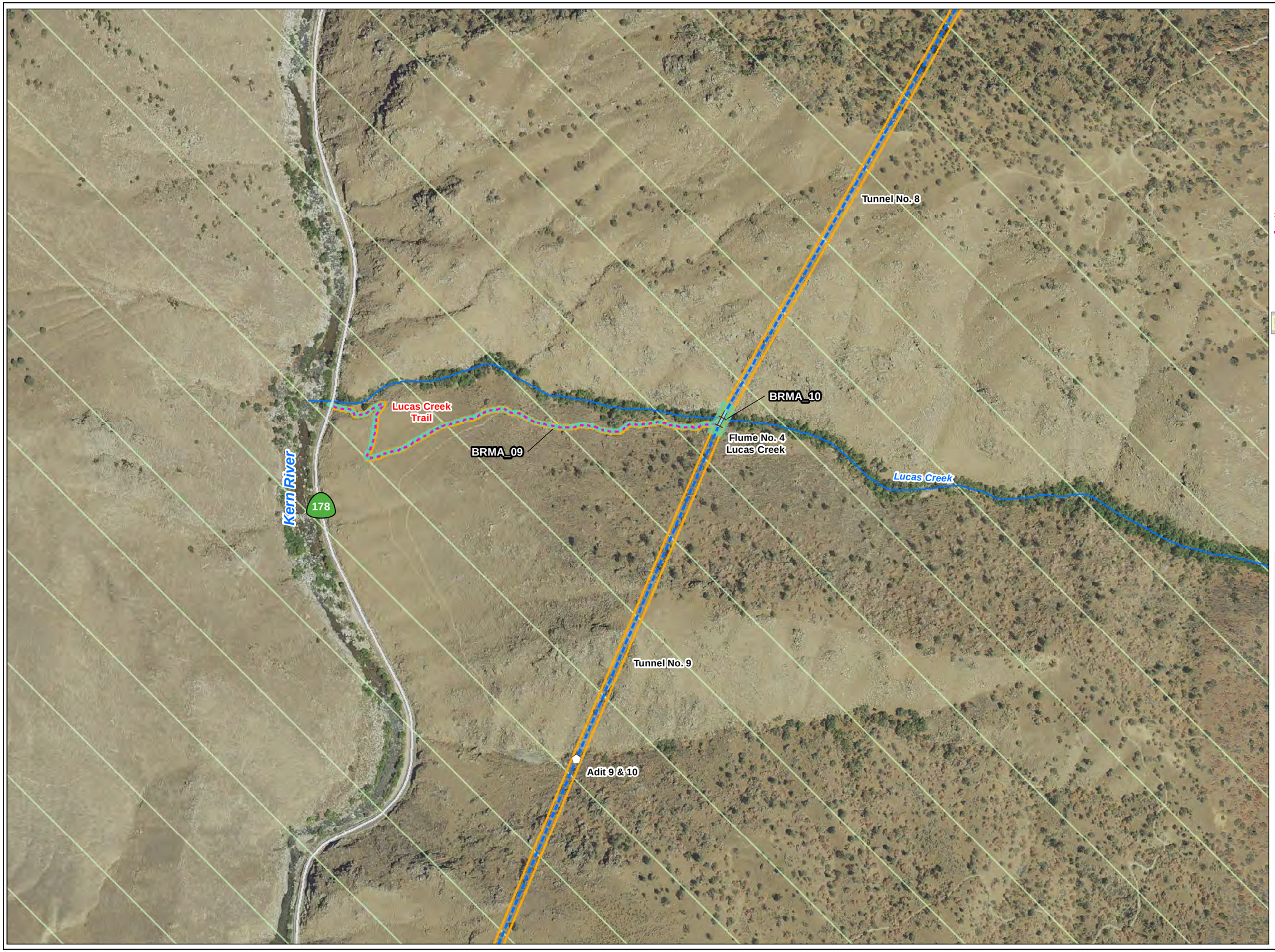
Map 5-5C

Non-Native Invasive Plants Within the FERC Project Boundary, Along Project Access Trails, and Along the Kern No. 1 Project Bypass Reach

0 250 500
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 10/30/2025



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication/ Powerline
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road
- Gate

Other Features

- Watercourse

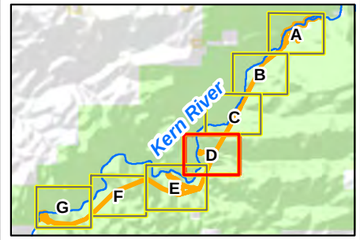
Land Jurisdiction*

- U.S. Forest Service

*SOURCE: BLM 2021

Non-Native Invasive Plants

- BRMAR, red brome
- BRTE, cheatgrass
- ONAC, scotch thistle
- POMO, rabbitsfoot grass
- VETH, common mullein
- POMO & VETH
- ONAC, BRTE, BRMAR, POMO & VETH



SOUTHERN CALIFORNIA EDISON
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Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

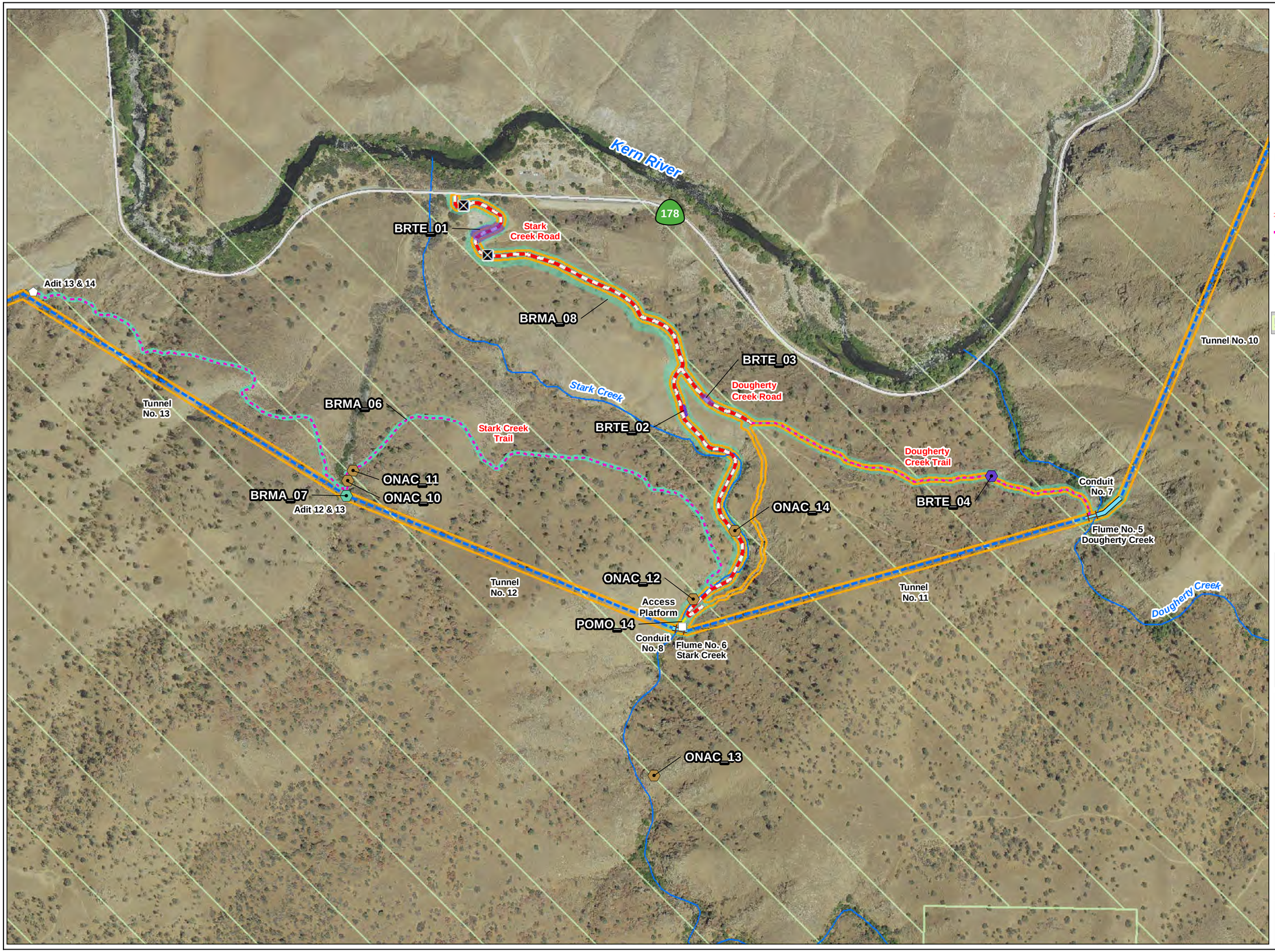
Map 5-5D

Non-Native Invasive Plants Within the FERC Project Boundary, Along Project Access Trails, and Along the Kern No. 1 Project Bypass Reach

0 250 500
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 10/30/2025



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication/ Powerline
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road
- Gate

Other Features

- Watercourse

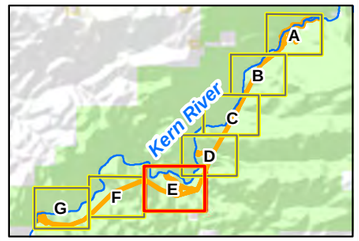
Land Jurisdiction*

- U.S. Forest Service

*SOURCE: BLM 2021

Non-Native Invasive Plants

- BRMAR, red brome
- BRTE, cheatgrass
- ONAC, scotch thistle
- POMO, rabbitsfoot grass
- VETH, common mullein
- POMO & VETH
- ONAC, BRTE, BRMAR, POMO & VETH



SOUTHERN CALIFORNIA EDISON
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Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-5E

Non-Native Invasive Plants Within the FERC Project Boundary, Along Project Access Trails, and Along the Kern No. 1 Project Bypass Reach

0 250 500
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 10/30/2025

Kern River
Pechacho Creek
178
BRMA_05
Adit 14 & 15
Tunnel No. 14
Tunnel No. 15
Adit 15 & 16

Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication/ Powerline
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road
- Gate

Other Features

- Watercourse

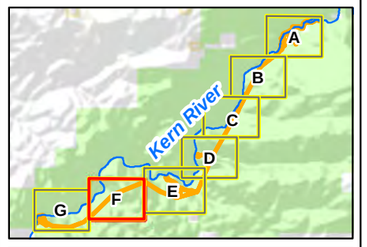
Land Jurisdiction*

- U.S. Forest Service

*SOURCE: BLM 2021

Non-Native Invasive Plants

- BRMAR, red brome
- BRTE, cheatgrass
- ONAC, scotch thistle
- POMO, rabbitsfoot grass
- VETH, common mullein
- POMO & VETH
- ONAC, BRTE, BRMAR, POMO & VETH



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

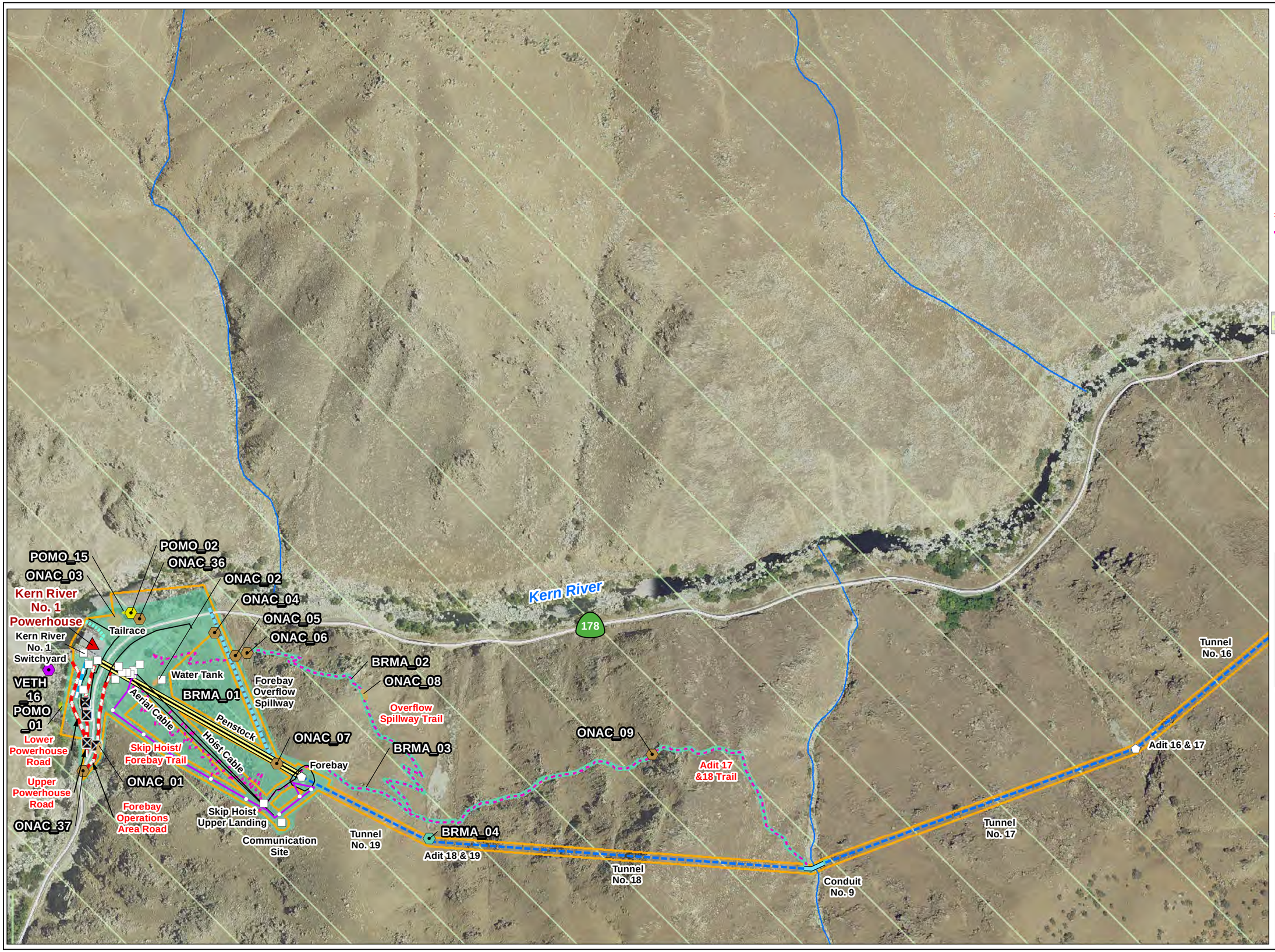
Map 5-5F

Non-Native Invasive Plants Within the FERC Project Boundary, Along Project Access Trails, and Along the Kern No. 1 Project Bypass Reach

0 250 500
Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 10/30/2025



Facilities

- Dam
- Powerhouse
- Water Conveyence Feature
- Tunnel
- Flume
- Conduit
- Sandbox
- Penstock
- Spillway
- Tailrace
- Gage
- Ancillary Facility
- Ancillary Feature
- Powerline
- Communication/ Powerline
- FERC Boundary

Transportation

- Project Road
- Project Trail
- Other Road
- Gate

Other Features

- Watercourse

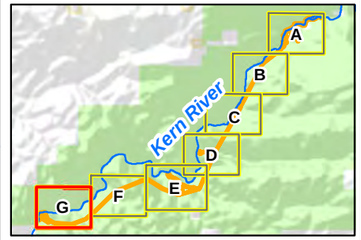
Land Jurisdiction*

- U.S. Forest Service

*SOURCE: BLM 2021

Non-Native Invasive Plants

- BRMAR, red brome
- BRTE, cheatgrass
- ONAC, scotch thistle
- POMO, rabbitsfoot grass
- VETH, common mullein
- POMO & VETH
- ONAC, BRTE, BRMAR, POMO & VETH



SOUTHERN CALIFORNIA EDISON
Energy for What's Ahead℠

Kern River No. 1 Hydroelectric Project
FERC Project No. 1930

Map 5-5G

Non-Native Invasive Plants Within the FERC Project Boundary, Along Project Access Trails, and Along the Kern No. 1 Project Bypass Reach

Date: 10/30/2025

0 250 500
Feet

Projection: UTM Zone 11
Datum: NAD 83

APPENDIX A

Vegetation Alliances within 1 Mile of the Kern River No. 1 FERC Project Boundary

The following vegetation alliance descriptions are excerpted from *Vegetation Descriptions, South Sierran Ecological Province, CALVEG Zone 4* (U.S. Department of Agriculture – Forest Service, Region 5; April 27, 2009) and *Central Valley Ecological Province, CALVEG Zone 5* (U.S. Department of Agriculture – Forest Service, Region 5; March 12, 2009).

HERB-DOMINATED ALLIANCES

ANNUAL GRASSES AND FORBS ALLIANCE (HG)

Throughout the low elevations of the western slopes of the southern Sierra Nevada, annual grasses such as bromes (*Bromus* spp.), needlegrass (*Achnatherum* spp.) and wild oats (*Avena* spp.) may dominate rolling hills. Dominant forbs in this alliance include owl's clover (*Orthocarpus* spp.), fiddleneck (*Amsinckia intermedia*) and stork's bill (*Erodium* spp.). They may occur in pure stands or contain an overstory of scattered oaks (*Quercus* spp.) or California buckeye (*Aesculus californica*). Associated westside species include hardwoods growing in sheltered areas and conifers such as gray pine (*Pinus sabiniana*) or Ponderosa pine (*Pinus ponderosa*) in the Upper Foothills Metamorphic Belt and Lower Batholith subsections. In some areas, this alliance may dominate a vast array of slopes and aspects due to wildfires, xeric conditions and other factors; on eastside slopes in the Eastern Slopes and Kern Plateau Subsections, recent wildfires have created large grass patches at elevations up to 8,000 feet (2440 meters) or more. Great Basin species such as big sagebrush (*Artemisia tridentata*), rabbitbrush (*Chrysothamnus* spp.), singleleaf pinyon pine (*Pinus monophylla*) and Jeffrey pine (*Pinus jeffreyi*) are often found adjacent to these patches.

SHRUB-DOMINATED ALLIANCES

ULTRAMAFIC MIXED SCRUB ALLIANCE (C1)

This type is found on ultramafic soils and has been mapped very sparsely in the Ranges and Foothills Sections at elevations generally below about 2,400 feet (732 meters) in this zone. The Ultramafic Mixed Shrub Alliance consists of a mixture of shrubs such as wedgeleaf ceanothus (*Ceanothus cuneatus* var. *cuneatus*), leather oak (*Quercus durata*), musk brush (*Ceanothus jepsonii*), California coffeeberry (*Rhamnus californica* ssp. *occidentalis*), silk-tassel (*Garrya elliptica*, *Garrya congdonii*), and Siskiyou mat (*Ceanothus pumilus*).

BACCHARIS (RIPARIAN) ALLIANCE (ML)

This Alliance identifies one or more species of *Baccharis* that dominate riparian areas and wetlands. It has been mapped in a limited area along Caliente Creek and other sites in the Foothills Section at elevations between 1,000–2,200 feet (305–670 meters). Species that may be in this Alliance include mule mat (*Baccharis salicifolia*), marsh Baccharis (*Baccharis douglasii*), and squaw waterweed (*Baccharis sergiloides*). This Alliance is found adjacent to upland species such as interior live oak, gray pine, California buckeye, chaparral yucca (*Yucca whipplei*), and rabbitbrush in this area.

TREE-DOMINATED ALLIANCES

INTERIOR MIXED HARDWOODS ALLIANCE (NX)

A mixture of upland hardwoods with no clearly dominant species occurs very commonly in the Lower Batholith and Tehachapi - Piute Mountains Subsections and more rarely in five other subsections. This type has been mapped most often in the elevation range of about 1,000–6,000 feet (305–1830 meters). The mixture includes any combination of interior live oak (*Quercus wislizenii*), canyon live oak (*Quercus chrysolepis*), blue oak (*Quercus douglasii*), and/or California buckeye (*Aesculus californic*a), with Valley oak (*Quercus lobata*) or black oak (*Quercus kelloggii*) occurring less frequently. The occasional overstory conifers may include gray pine or Ponderosa pine. Lower-elevation shrubs in canopy openings such as wedgeleaf ceanothus and birchleaf mountain mahogany (*Cercocarpus betuloides*) may also be present onsite or in the vicinity.

GRAY PINE ALLIANCE (PD)

This alliance, dominated by gray pine, grows primarily in the foothills of the Sierra Nevada on steep, dry rocky canyons with south aspects, below about 4,200 feet. In the northern Sierra, it is found mainly in the Upper Foothill Metamorphic Belt and the Granitic and Metamorphic Foothills subsections. These sites are typically diverse in structure, with a mixture of hardwoods such as canyon live oak, interior live oak, and blue oak; and low-elevation chaparral shrubs such as wedgeleaf ceanothus and whiteleaf and common manzanitas. Patches of annual grasses are often found adjacent to grey pine stands.

BLUE OAK ALLIANCE (QD)

The Blue Oak Alliance occurs on shallow upland soils in foothill savannas adjacent to the western slopes of the Sierra Nevada. It has been mapped in five ecological units, most commonly in the Tehachapi – Piute Mountains, Lower Batholith and Upper Foothills Metamorphic Belt Subsections. Elevations where mapped are often in the 1000–5800 feet (305–1768 meters) range, highest towards the south. Blue oak naturally occurs in an oak-grass association on well drained, gentle slopes. Gray pine is the most common tree associate in this hillside type; interior live oak may also be a major hardwood occurring in close proximity to this type. Non-stump sprouting chaparral shrubs such as wedgeleaf ceanothus, manzanitas (Arctostaphylos spp.), coffeeberry, California buckwheat (*Eriogonum fasciculatum*) and poison oak (*Toxicodendron diversilobum*) are scattered throughout this Alliance, and chamise (*Adenostoma fasciculatum*) often occurs adjacent to these sites.

VALLEY OAK ALLIANCE (QL)

This alliance is dominated by Valley oak, a deeply rooting hardwood, which formerly occurred in pure stands of large trees with limited woody understory. These stands occurred on valley bottoms and in rolling slopes, generally below 2,000 feet (610 meters) in the north. The present distribution pattern of Valley Oak is along major stream courses and on the deep, rich loamy soils of their alluvial deposits in areas within and along the eastern and western fringes of this zone. It has been mapped occasionally as a dominant hardwood in

the three sections up to an elevation of about 5,000 feet (1,524 meters) and more rarely as an understory hardwood in Ponderosa pine and gray pine forests and woodlands. A few scattered interior and/or canyon live oaks can be found throughout this Alliance.

CALIFORNIA SYCAMORE ALLIANCE (QP)

California sycamore (*Platanus racemosa*) is a tall, fast-growing riparian tree that occurs from California to Baja California. Pure stands of it have been mapped sparsely in eight subsections of both the Coast and Ranges Sections in this zone and is found at low elevations, usually less than 1800 feet (548 meters). Common hardwood and shrub associates along these streams include Fremont cottonwood (*Populus fremontii*), willows (*Salix* spp.), white alder (*Alnus rhombifolia*), and coast live oak (*Quercus agrifolia*).

INTERIOR LIVE OAK ALLIANCE (QW)

Interior live oak (*Quercus wislizenii*), an evergreen, shade-tolerant upland hardwood, occurs from northern California to Baja California in two recognized varieties as a shrub (*Q. w. var. frutescens*) and a tree (*Q. w. var. wislizenii*). As a dominant hardwood in this alliance, it occurs both in interior valleys and seaward sides of the Coast Ranges, but generally is found in pure stands inland from the Coast Live Oak Alliance. Interior live oak typically associates with chamise (*Adenostoma fasciculatum*), blue oak (*Quercus douglasii*), and gray pine (*Pinus sabiniana*) in savanna-like stands on these sites. It has been mapped only sparsely in the Suisan Hills and Valleys and East Bay Hills – Mt. Diablo Subsections of the Coast Section at elevations below about 3600 feet (1098 meters).

NON-VEGETATED AREAS

TILLED EARTH (A3)

Agricultural lands may be mapped as barren and lacking vegetation on occasion, such as after harvesting and during seasons prior to crop growth. Some areas may be kept fallow during and after the growing season for various reasons such as conservation of moisture and nutrients in a crop rotation schedule.

BARREN (BA)

Landscapes generally devoid of vegetation as seen from a high-altitude image source such as aerial photography, are labeled as Barren. This category includes mappable landscape units in which surface lithology is dominant, such as exposed bedrock, cliffs, interior sandy or gypsum areas, and the like. It does not include areas considered as modified or developed, as in urban areas but quarries and open pit mine sites are included in the Barren category.

URBAN-RELATED BARE SOIL (IB)

Urban development in California occurs in phases. When land is cleared prior to being paved, this category represents the occurrence of non-vegetated barren ground that is caused by urbanization. This land-use type also represents other mechanically-caused

barren ground, such as open quarries or mined areas, barren ground along highways, and other areas cleared of vegetation prior to construction. These sites have been mapped extensively in the Santa Maria Valley and adjoining sections of the South Coastal San Lucia Ranges Subsections, usually adjacent to agricultural areas, already established urbanized centers or paved areas of the landscape. California Sagebrush (*Artemisia californica*) and annual grasses and forbs may be present in the immediate vicinity of these sites.

AQUATIC AREAS

AGRICULTURE POND OR WATER FEATURE (A7)

Some artificially constructed water features on otherwise agricultural sites on farms, ranches and the like, are large enough to map and document. These sites include stock ponds, small reservoirs, large ditches and other utilitarian or recreational water features.

RIVER/STREAM/CANAL (W1)

Water is labeled in CalVeg mapping in those cases in which permanent sources of surface water are identified within a landscape unit of sufficient size to be mapped. The category includes lakes, streams and canals of various size, bays and estuaries and similar water bodies. These areas are considered to have a minimum of vegetation components, except along the edges, which may be mapped as types such as wet meadows, tule–cattail freshwater marshes, or pickleweed–cordgrass saline or mixed marshes. Islands within water bodies may be mapped according to their terrestrial dominant vegetation types. In addition, surface water bodies have recently been mapped separately in some parts of this zone under the following categories: W1: Rivers and Streams (natural, flowing surface waters) W2: Perennial Lakes and Ponds (natural lacustrine bodies) W3: Reservoirs (man-made lakes and ponds) W5: Playas (desert basin features) W6: Intermittent Stream Channel (seasonally flowing channeled waters) W8: Intermittent or Seasonal Lake or Pond (occasionally drained surface waters) W9: Exposed non-water features such as gravel, sand bars, etc.

APPENDIX B

Representative Photographs of Bypass Reach Riparian Cross-Sections

Photo B-1. Representative photograph of riparian transect KT1 on the Kern River. Approximately 0.5 mile upstream of the Kern 1 power station.

Photo B-2. Representative photograph of riparian transect KT2 on the Kern River. Approximately 2.7 miles upstream of the Kern 1 power station.

Photo B-3. Representative photograph of riparian transect KT3 on the Kern River. Approximately 3.7 miles upstream of the Kern 1 power station.

Photo B-4. Representative photograph of riparian transect KT4 on the Kern River. Approximately 4 miles upstream of the Kern 1 power station.

Photo B-5. Representative photograph of riparian transect KT5 on the Kern River. Approximately 5 miles upstream of the Kern 1 power station.

Photo B-6. Representative photograph of riparian transect KT6 on the Kern River. Approximately 6.7 miles upstream of the Kern 1 power station.

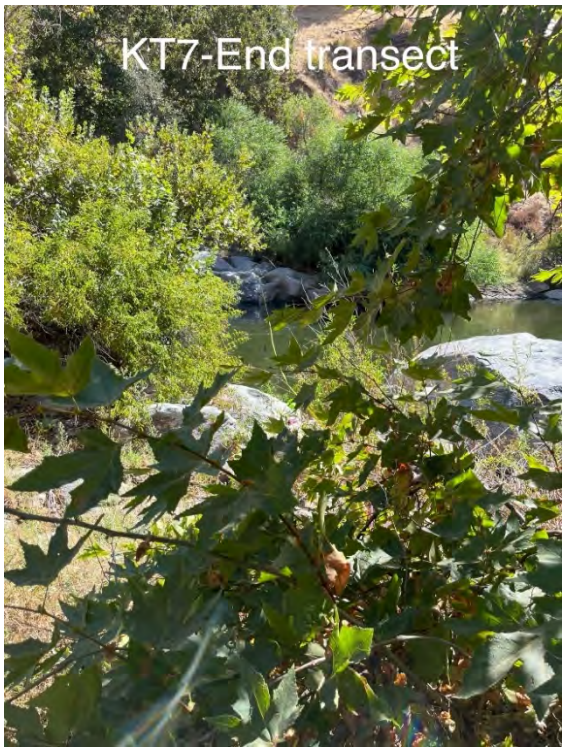


Photo B-7. Representative photograph of riparian transect KT7 on the Kern River. Approximately 7.5 miles upstream of the Kern 1 power station.

Photo B-8. Representative photograph of riparian transect KT8 on the Kern River. Approximately 7.9 miles upstream of the Kern 1 power station.

Photo B-9. Representative photograph of riparian transect KT9 on the Kern River. Approximately 9.6 miles upstream of the Kern 1 power station.

Photo B-10. Representative photograph of riparian transect KT10 on the Kern River. Approximately 9.9 miles upstream of the Kern 1 power station.

APPENDIX C

Relationship Between Riparian Vegetation and Flow Conditions

The following figures show the results of the analysis of the relationship between the riparian vegetation and flow conditions.

Figures D-1 through D-10 provide a depiction of the relationship between water surface elevation and discharge (cubic feet per second [cfs]) at each of the ten transects.

Figures D-11 through D-20 show the percent inundation for the period of record (1990–2023) under the Existing Project and Without-Project hydrology scenarios.

Figures D-21 through D-30 show the average number of days of inundation at flows greater than 1,631 cfs (without-Project 2-year recurrence interval), for the Kern River below Democrat Dam at each of the riparian transects.

Figures D-31 through D-40 show the average yearly recession rate for a dry, normal, and wet water year at each riparian transect. The figures show recession rates of spring/early summer flows during the time of spring seed release and seed setting (during the receding limb of the hydrograph). Recession rates of 1.6 inches per day are represented as a dotted line on each graph.

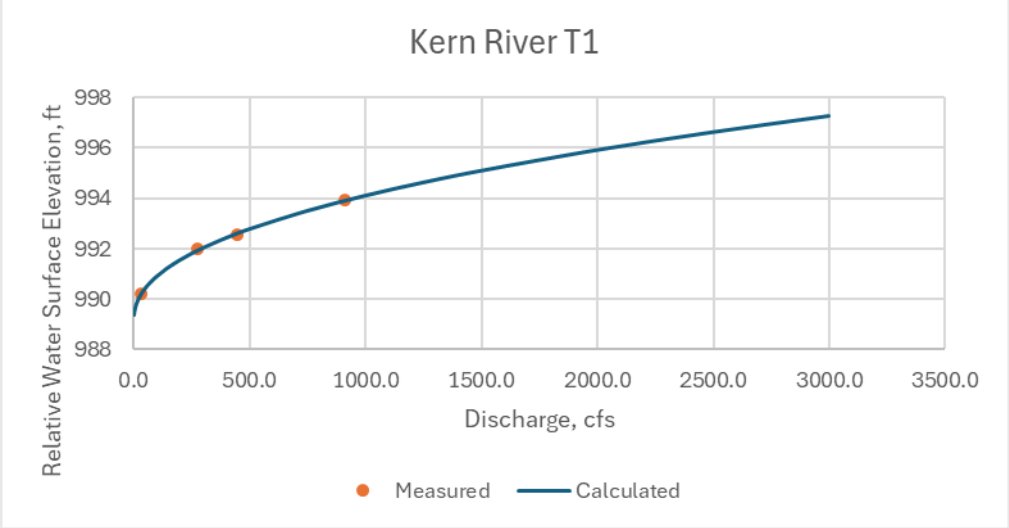


Figure C-1. Kern River stage-discharge regression for Riparian Transect KT1.

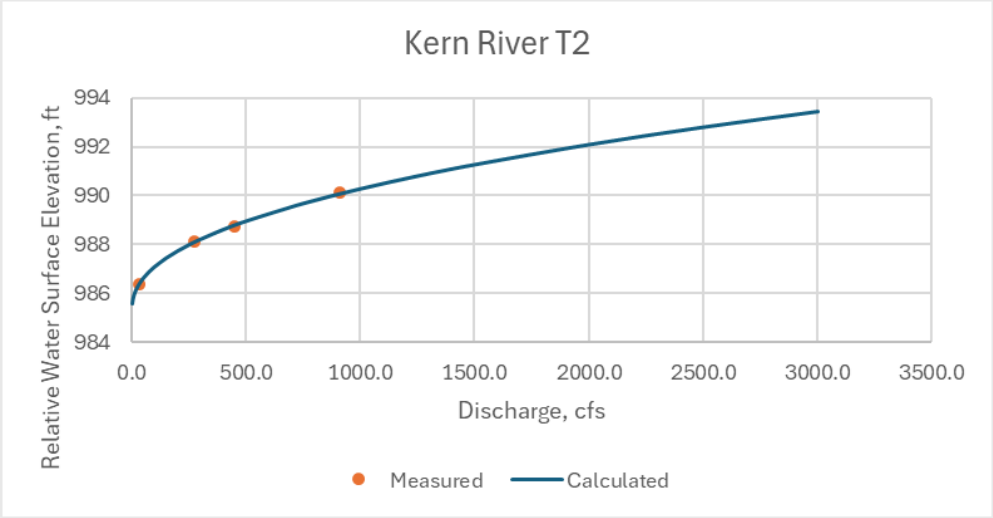


Figure C-2. Kern River stage-discharge regression for Riparian Transect KT2.

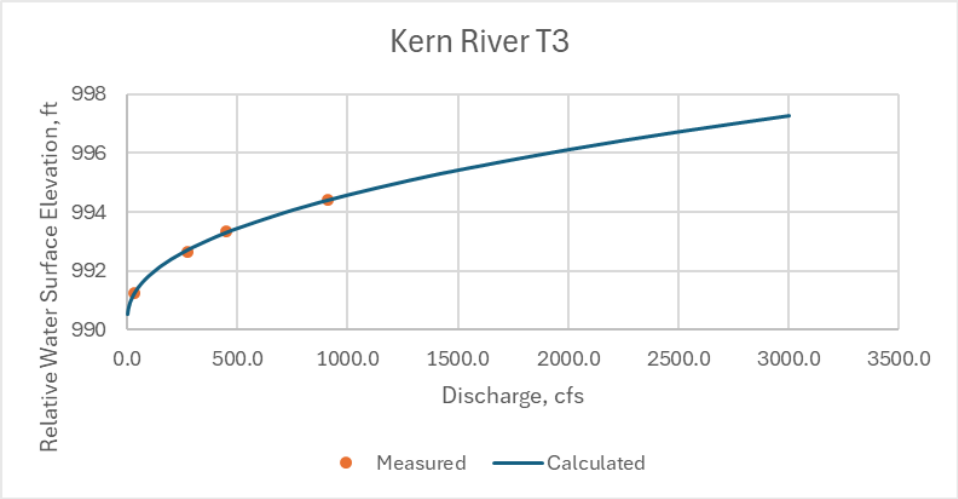


Figure C-3. Kern River stage-discharge regression for Riparian Transect KT3.

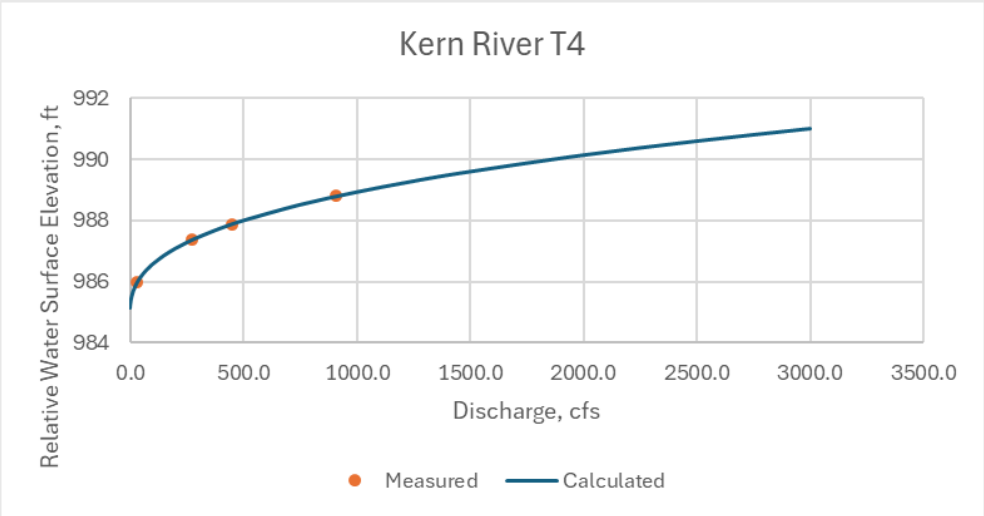


Figure C-4. Kern River stage-discharge regression for Riparian Transect KT4.

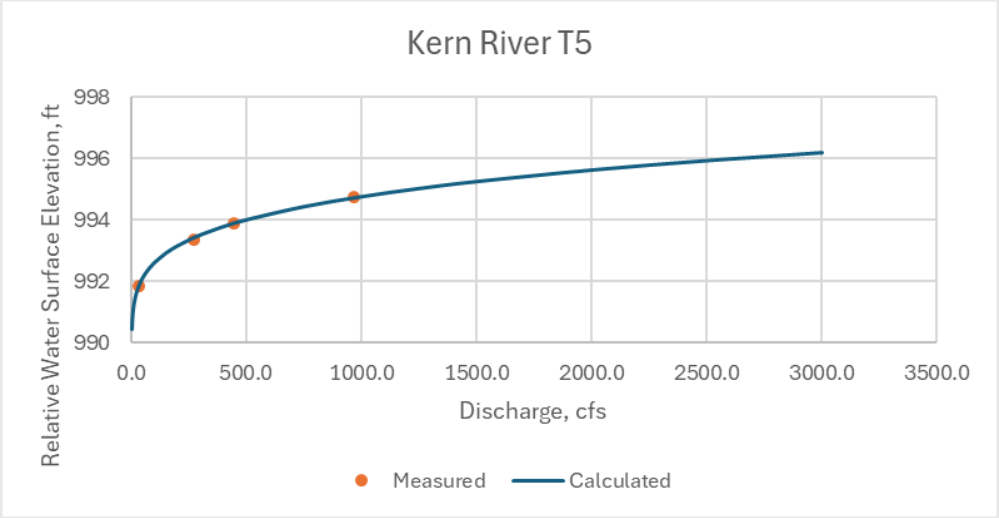


Figure C-5. Kern River stage-discharge regression for Riparian Transect KT5.

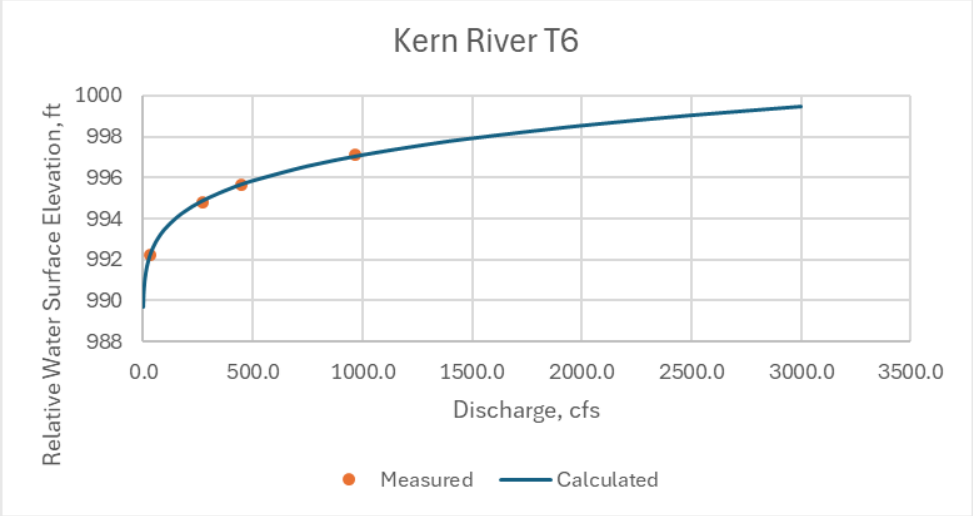


Figure C-6. Kern River stage-discharge regression for Riparian Transect KT6.

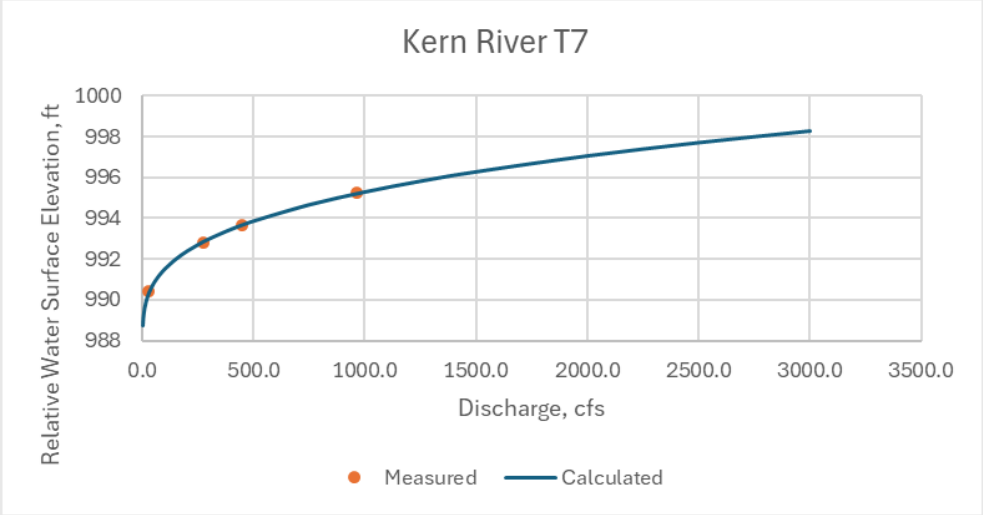


Figure C-7. Kern River stage-discharge regression for Riparian Transect KT7.

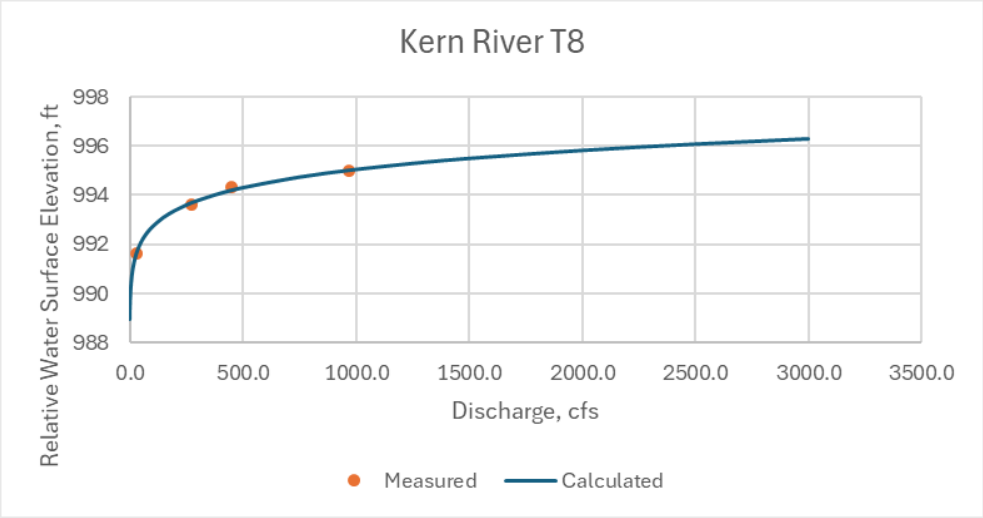


Figure C-8. Kern River stage-discharge regression for Riparian Transect KT8.

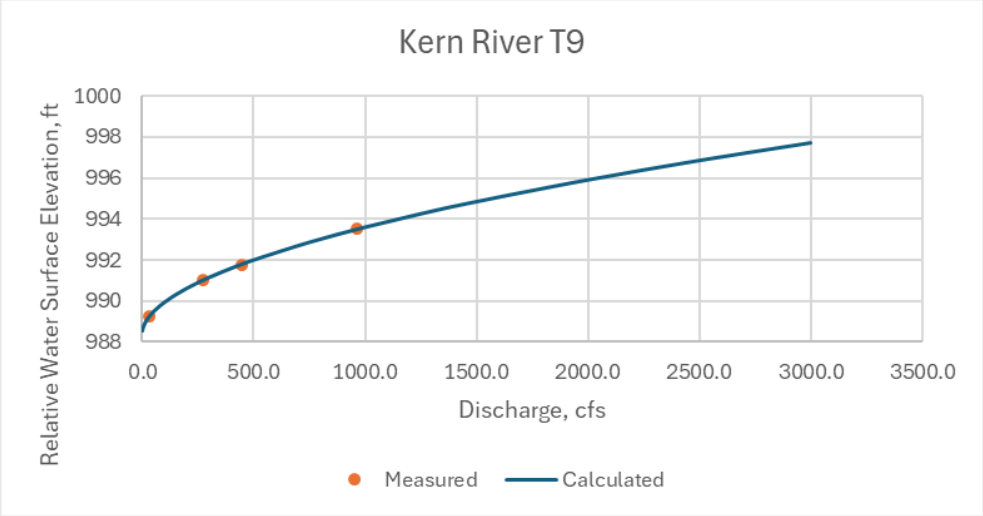


Figure C-9. Kern River stage-discharge regression for Riparian Transect KT9.

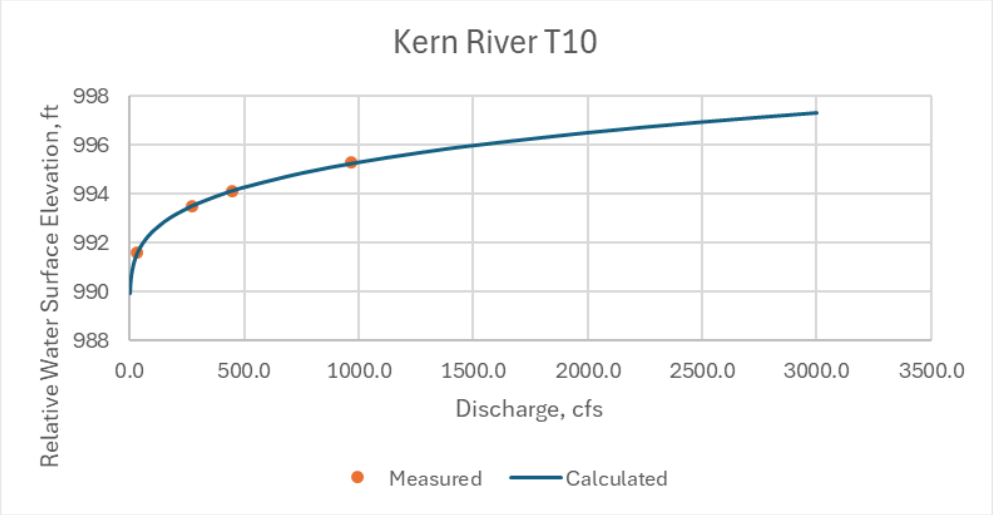


Figure C-10. Kern River stage-discharge regression for Riparian Transect KT10.

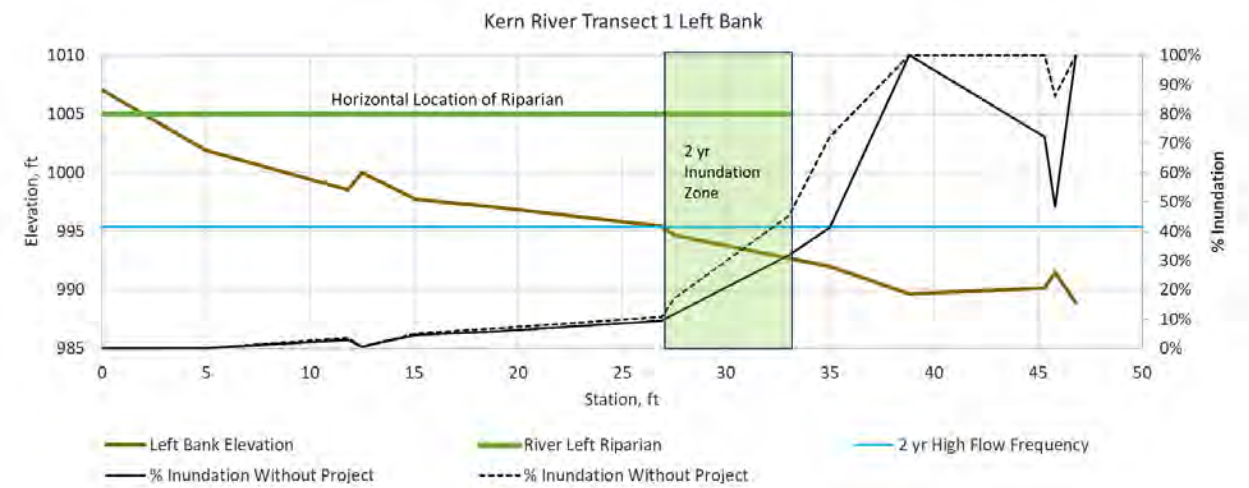


Figure C-11. Kern River inundation at Riparian Transect KT1, showing 2-year high-flow frequency flow elevations (1990–2023) and the percent of time inundated for Existing Project and Without Project hydrology.

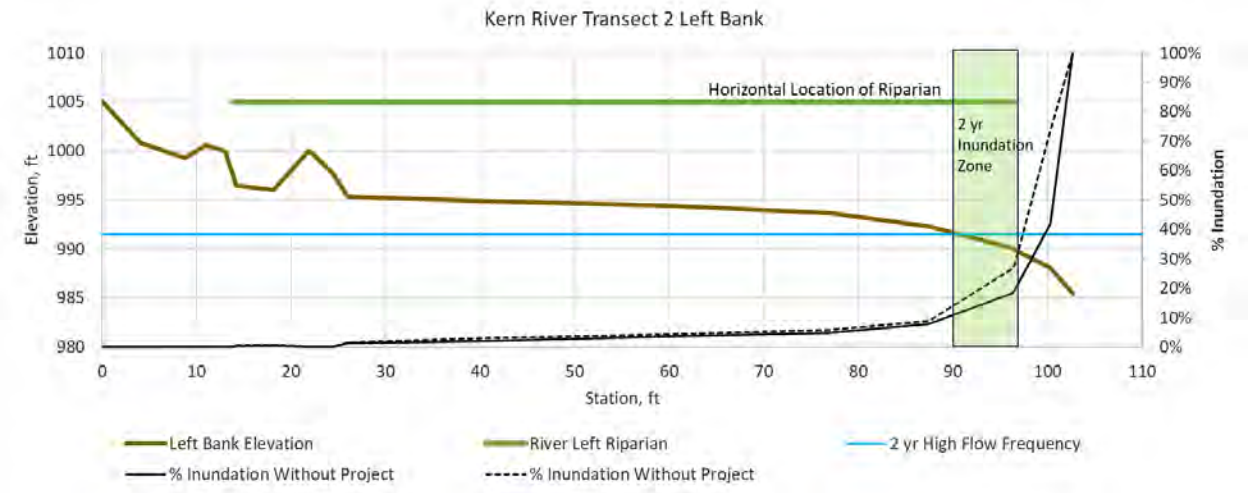


Figure C-12. Kern River inundation at Riparian Transect KT2, showing 2-year high-flow frequency flow elevations (1990–2023) and the percent of time inundated for Existing Project and Without Project hydrology.

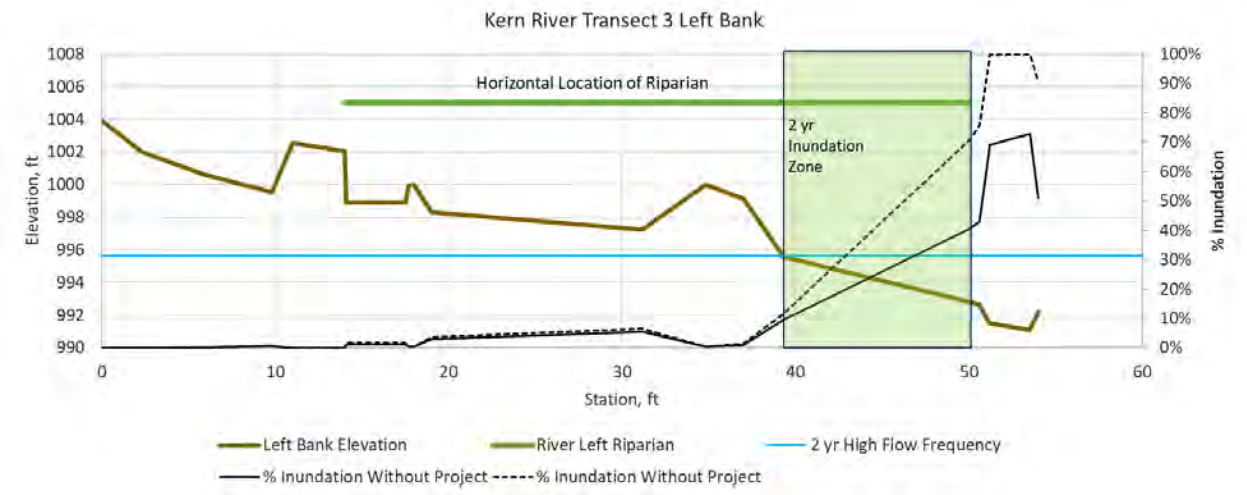


Figure C-13. Kern River inundation at Riparian Transect KT3, showing 2-year high-flow frequency flow elevations (1990–2023) and the percent of time inundated for Existing Project and Without Project hydrology.

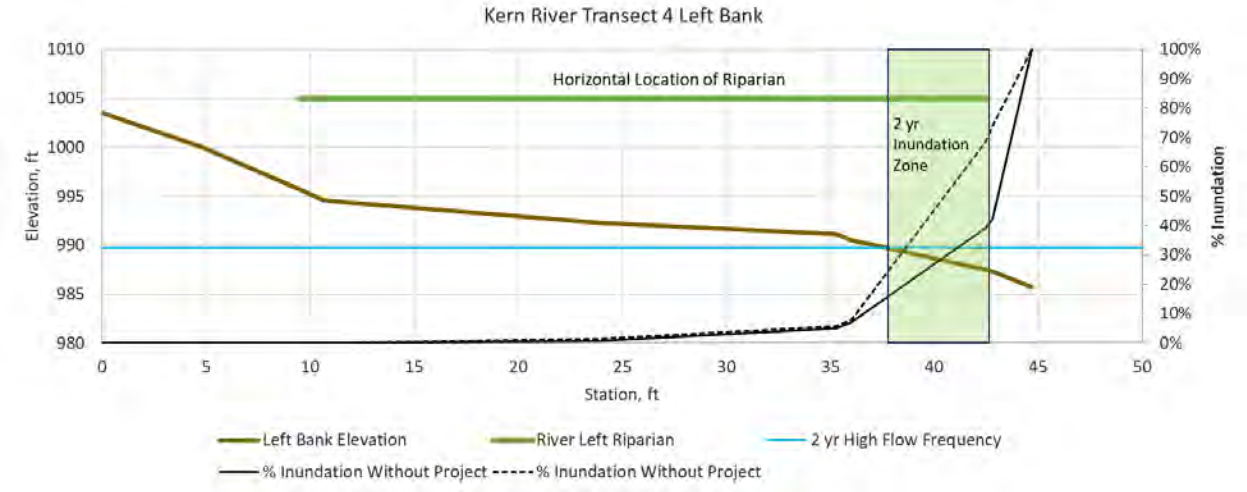


Figure C-14. Kern River inundation at Riparian Transect KT4, showing 2-year high-flow frequency flow elevations (1990–2023) and the percent of time inundated for Existing Project and Without Project hydrology.

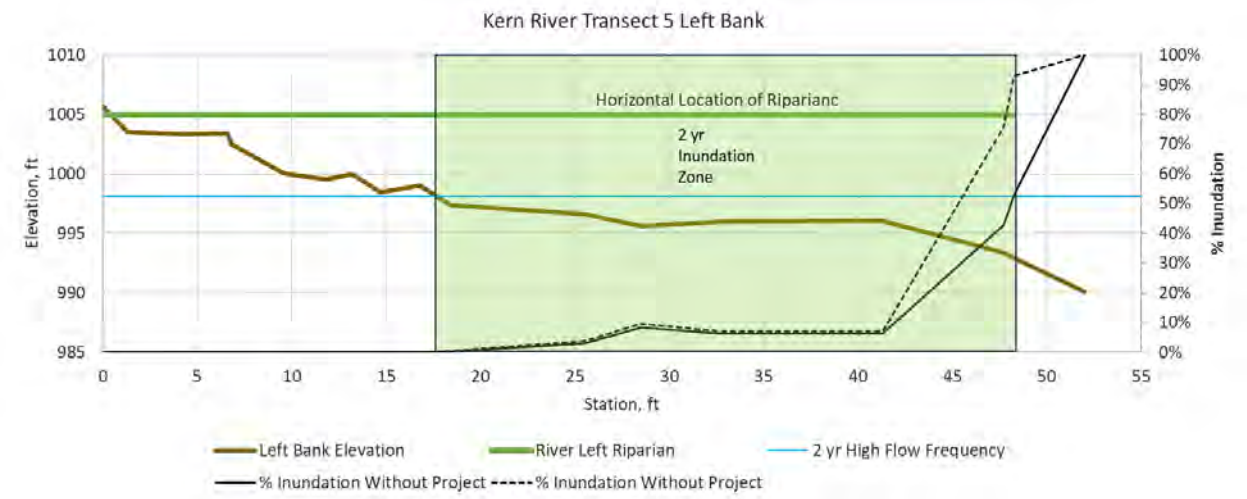


Figure C-15 Kern River inundation at Riparian Transect KT5, showing 2-year high-flow frequency flow elevations (1990–2023) and the percent of time inundated for Existing Project and Without Project hydrology.

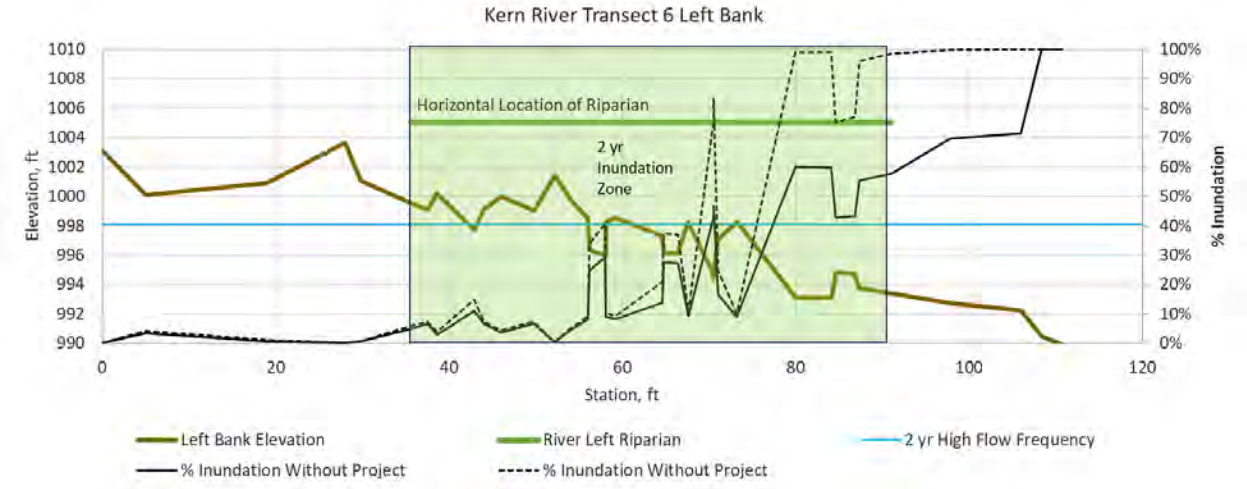


Figure C-16. Kern River inundation at Riparian Transect KT6, showing 2-year high-flow frequency flow elevations (1990–2023) and the percent of time inundated for Existing Project and Without Project hydrology.

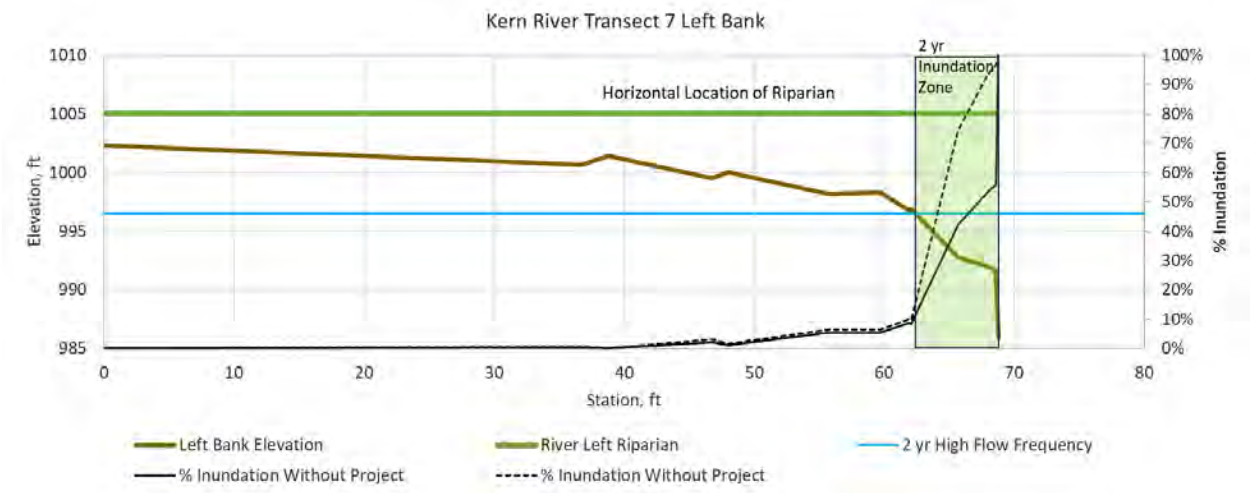


Figure C-17. Kern River inundation at Riparian Transect KT7, showing 2-year high-flow frequency flow elevations (1990–2023) and the percent of time inundated for Existing Project and Without Project hydrology.

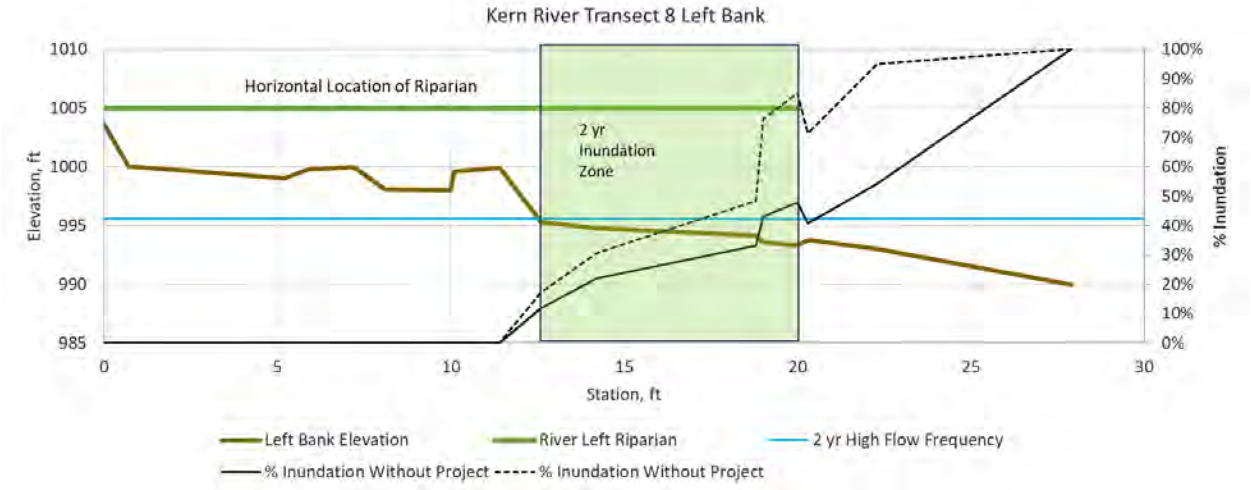


Figure C-18. Kern River inundation at Riparian Transect KT8, showing 2-year high-flow frequency flow elevations (1990–2023) and the percent of time inundated for Existing Project and Without Project hydrology.

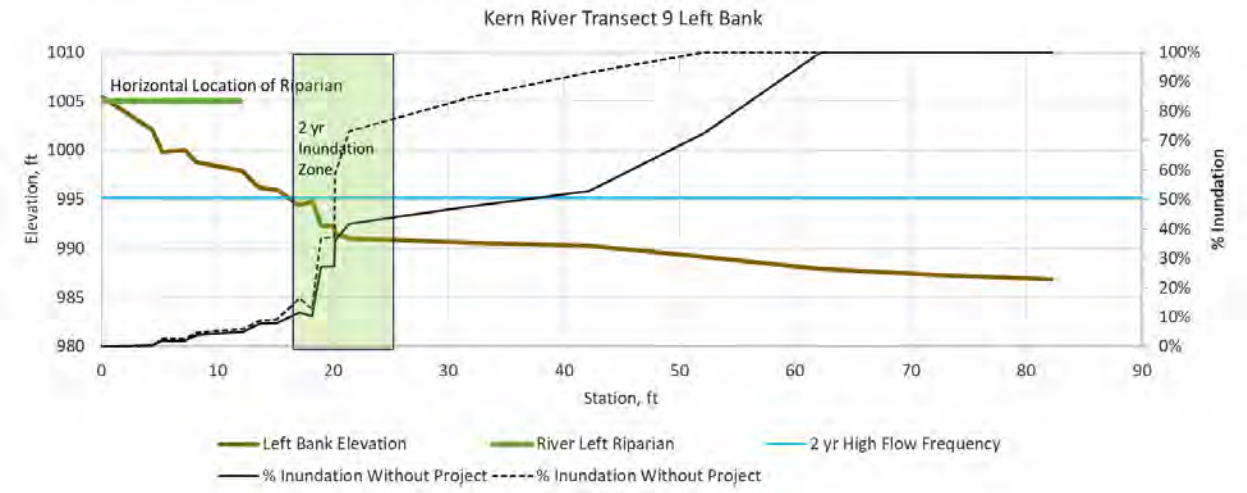


Figure C-19. Kern River inundation at Riparian Transect KT9, showing 2-year high-flow frequency flow elevations (1990–2023) and the percent of time inundated for Existing Project and Without Project hydrology.

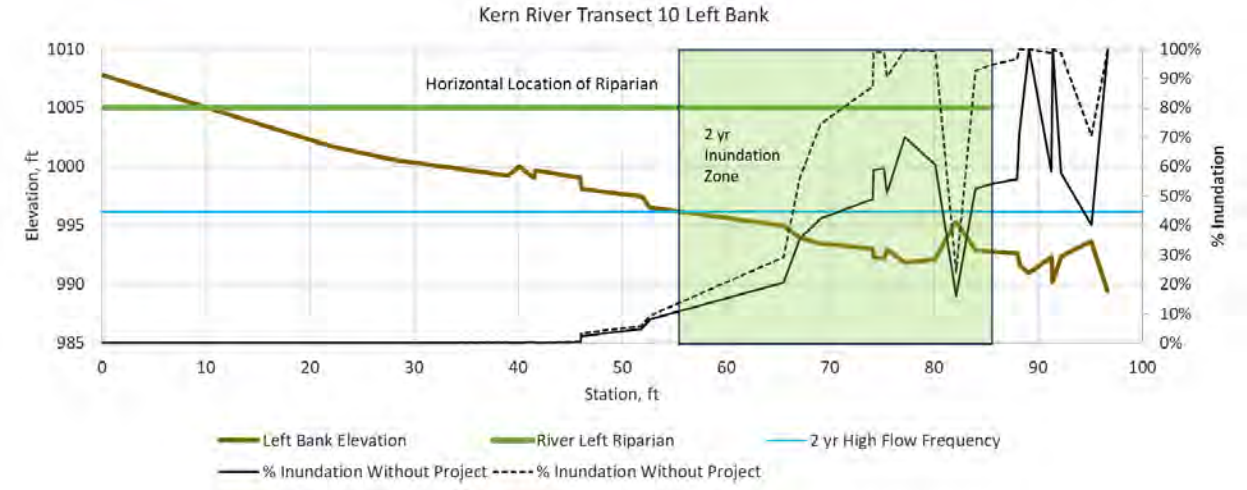


Figure C-20. Kern River inundation at Riparian Transect KT10, showing 2-year high-flow frequency flow elevations (1990–2023) and the percent of time inundated for Existing Project and Without Project hydrology.

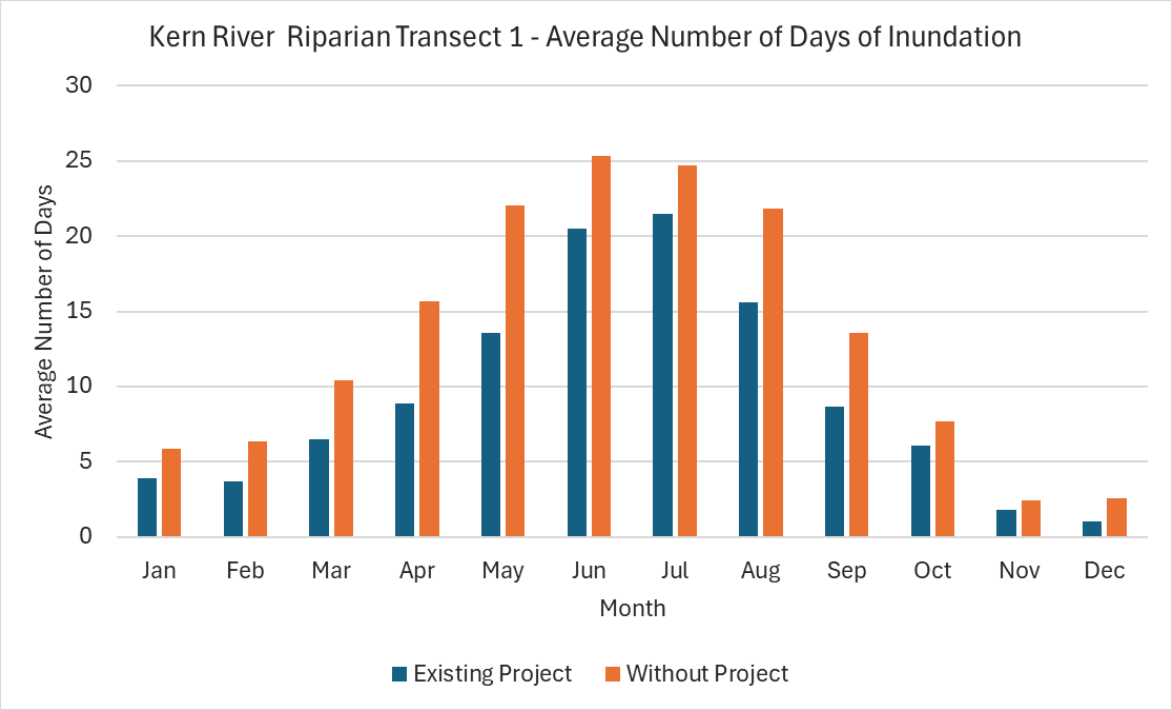


Figure C-21. Average number of days inundation at flows ≥ 1,631 cfs (Without-Project 2-yr recurrence interval), for the Kern River below Democrat Dam at Riparian Transect KT1

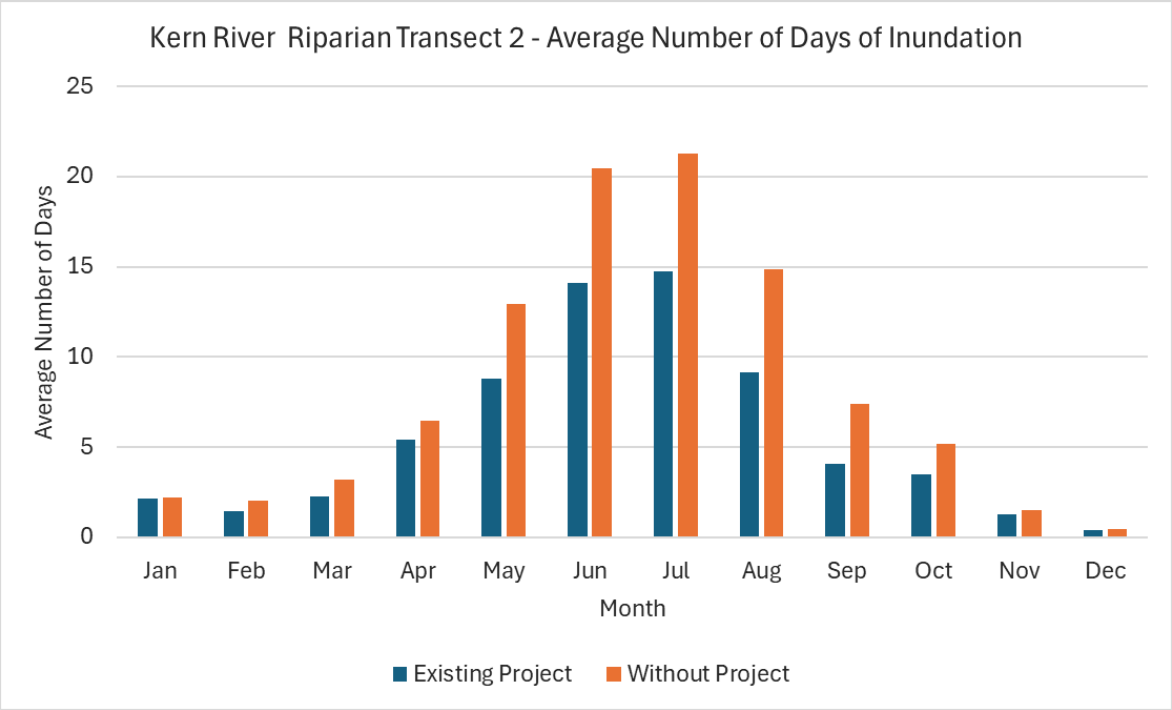


Figure C-22. Average number of days inundation at flows ≥ 1,631 cfs (Without-Project 2-yr recurrence interval), for the Kern River below Democrat Dam at Riparian Transect KT2

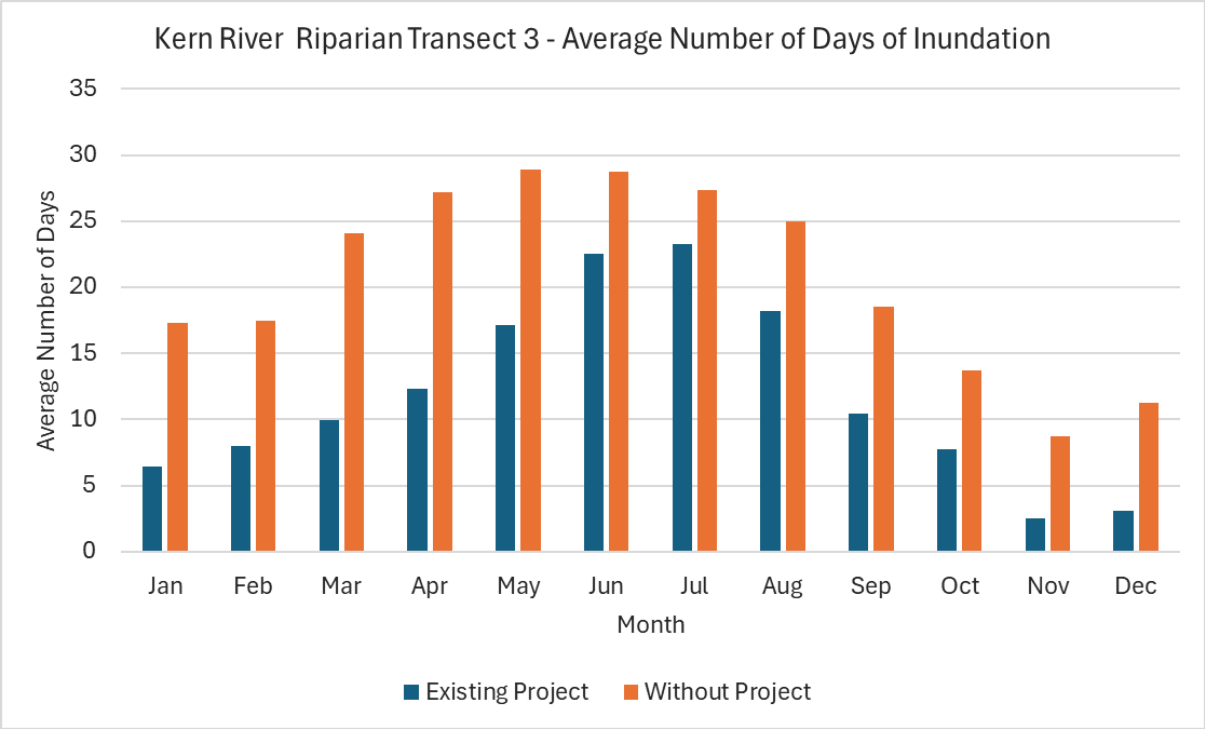


Figure C-23. Average number of days inundation at flows ≥ 1,631 cfs (Without-Project 2-yr recurrence interval), for the Kern River below Democrat Dam at Riparian Transect KT3

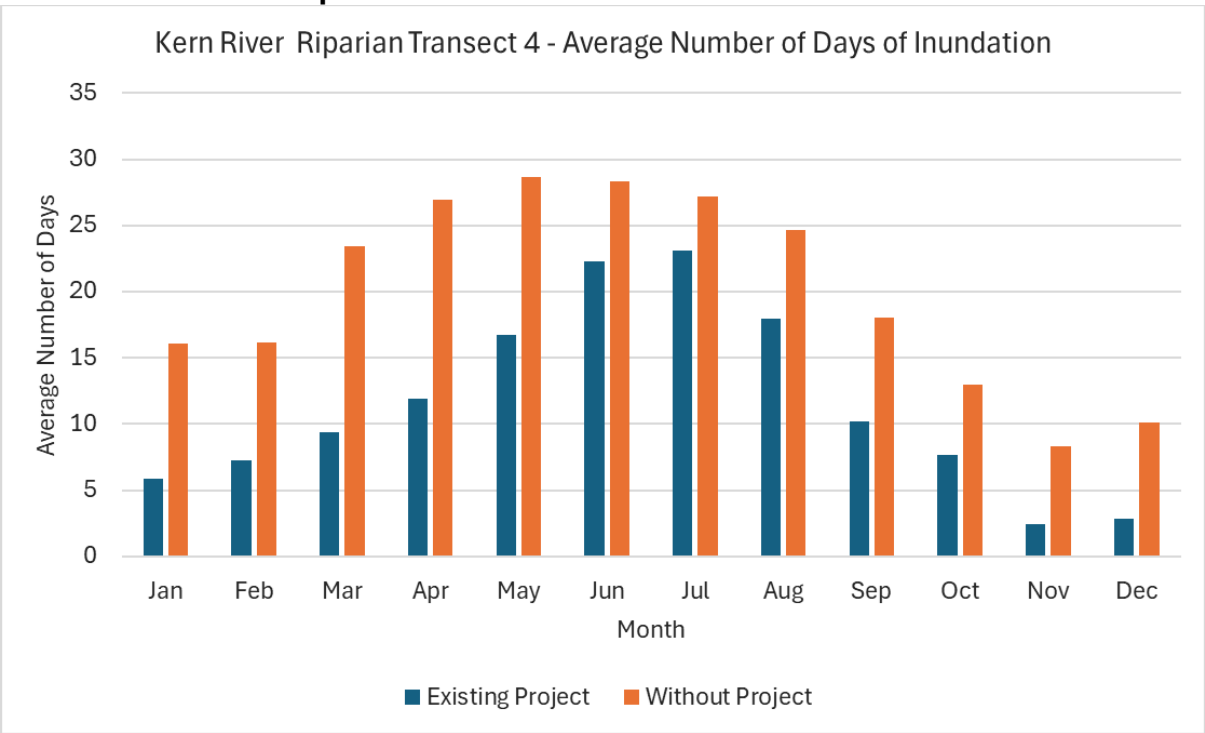


Figure C-24. Average number of days inundation at flows ≥ 1,631 cfs (Without-Project 2-yr recurrence interval), for the Kern River below Democrat Dam at Riparian Transect KT4

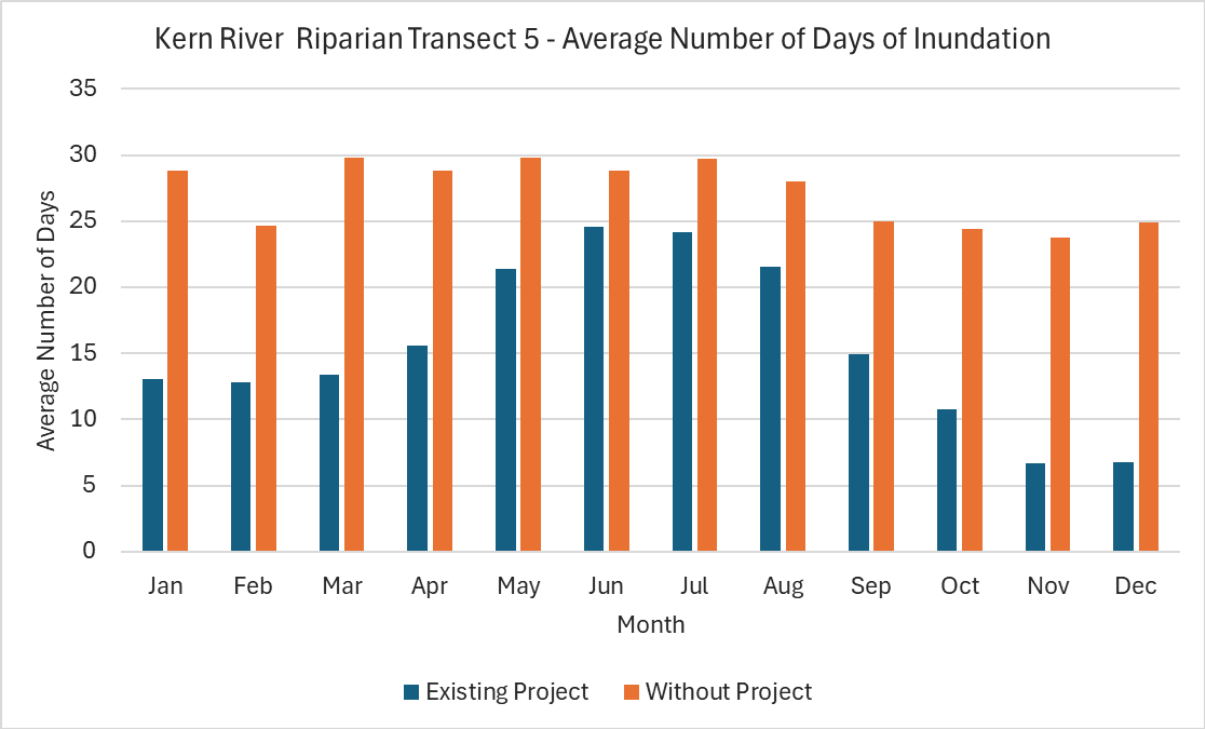


Figure C-25. Average number of days inundation at flows ≥ 1,631 cfs (Without-Project 2-yr recurrence interval), for the Kern River below Democrat Dam at Riparian Transect KT5

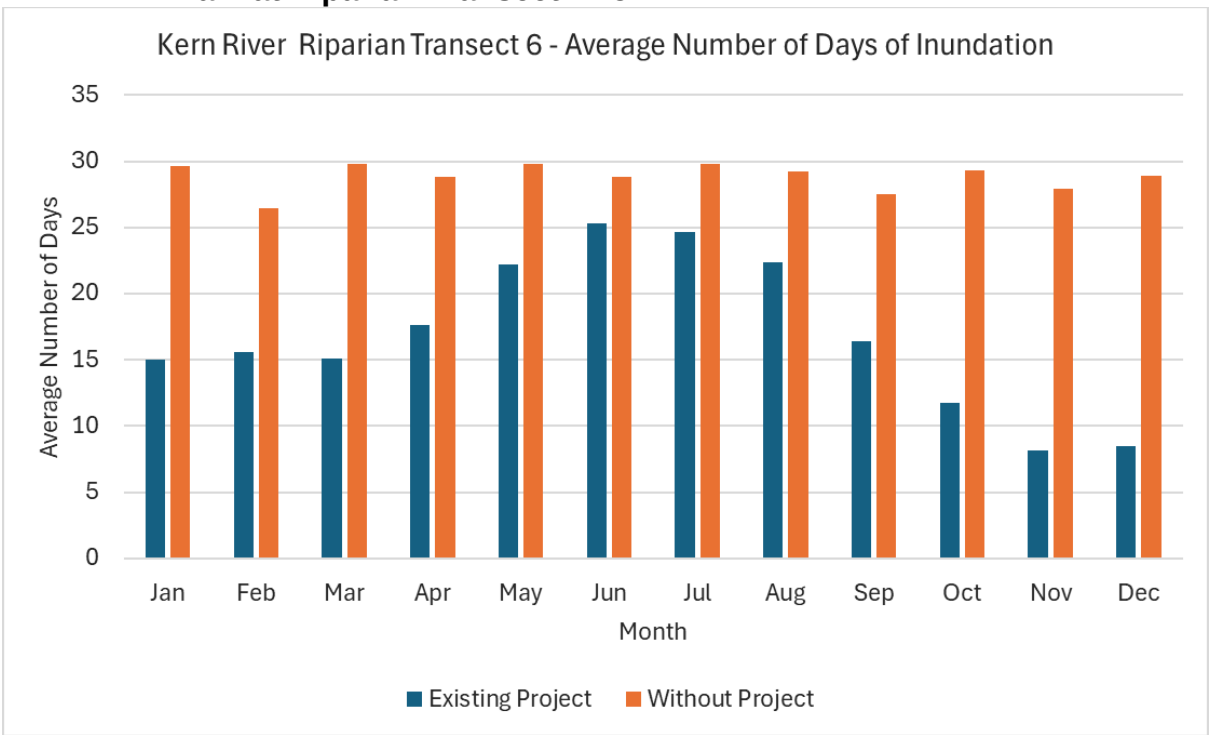


Figure C-26. Average number of days inundation at flows ≥ 1,631 cfs (Without-Project 2-yr recurrence interval), for the Kern River below Democrat Dam at Riparian Transect KT6

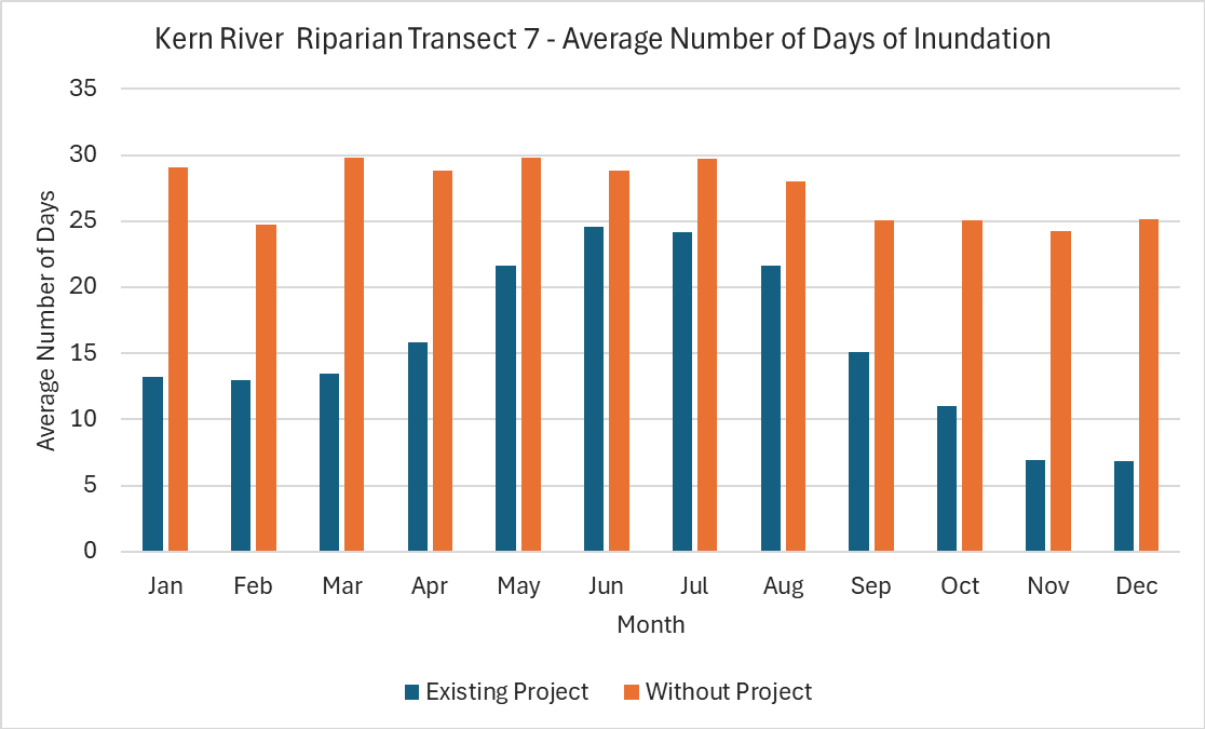


Figure C-27. Average number of days inundation at flows ≥ 1,631 cfs (Without-Project 2-yr recurrence interval), for the Kern River below Democrat Dam at Riparian Transect KT7

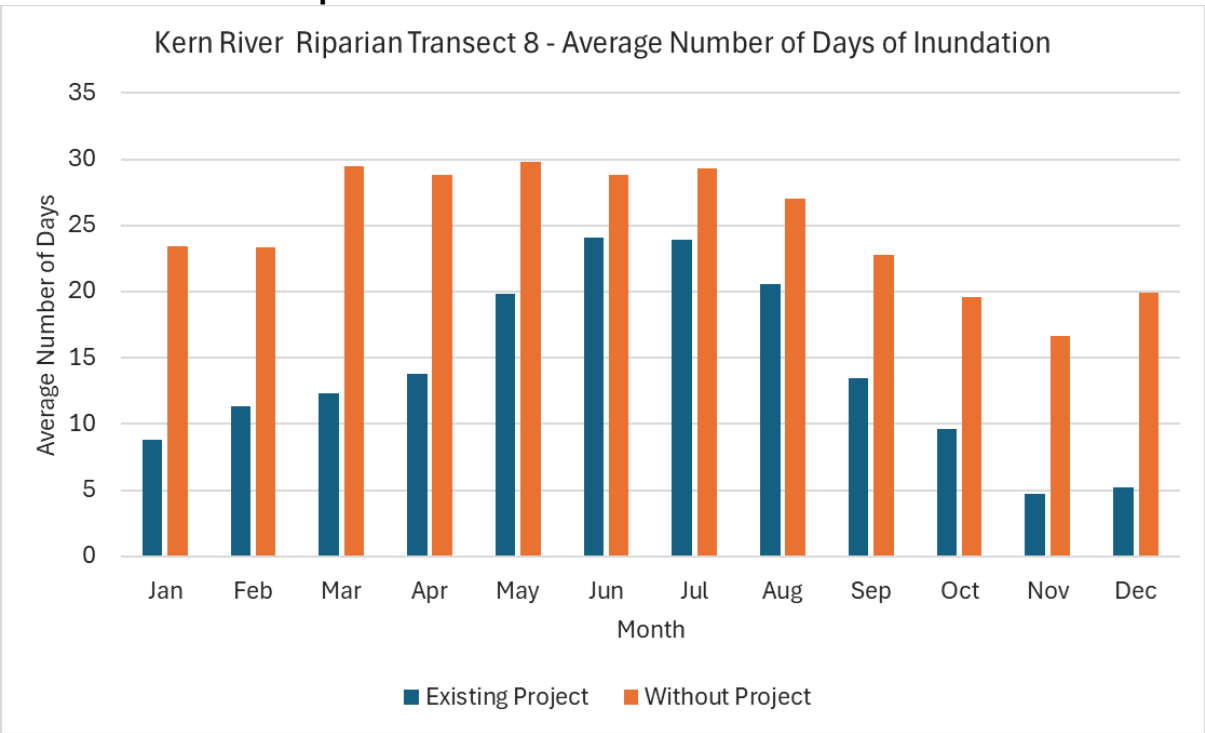


Figure C-28. Average number of days inundation at flows ≥ 1,631 cfs (Without-Project 2-yr recurrence interval), for the Kern River below Democrat Dam at Riparian Transect KT8

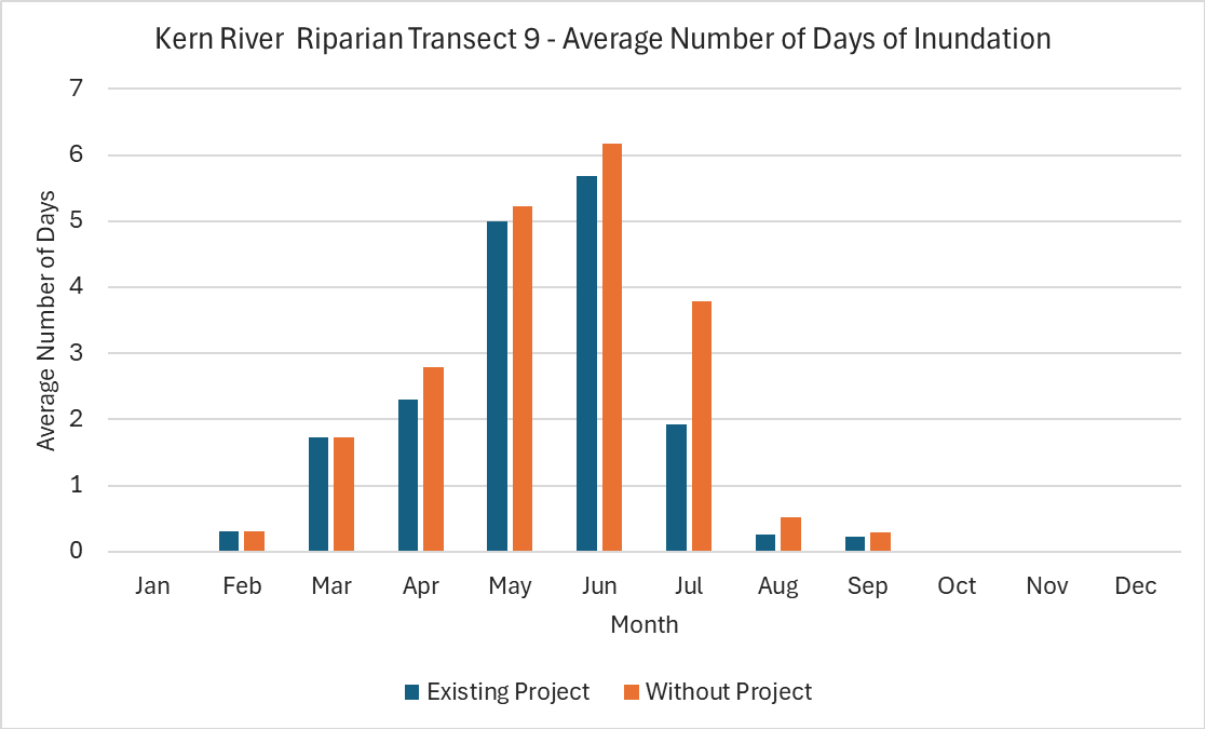


Figure C-29. Average number of days inundation at flows ≥ 1,631 cfs (Without-Project 2-yr recurrence interval), for the Kern River below Democrat Dam at Riparian Transect KT9

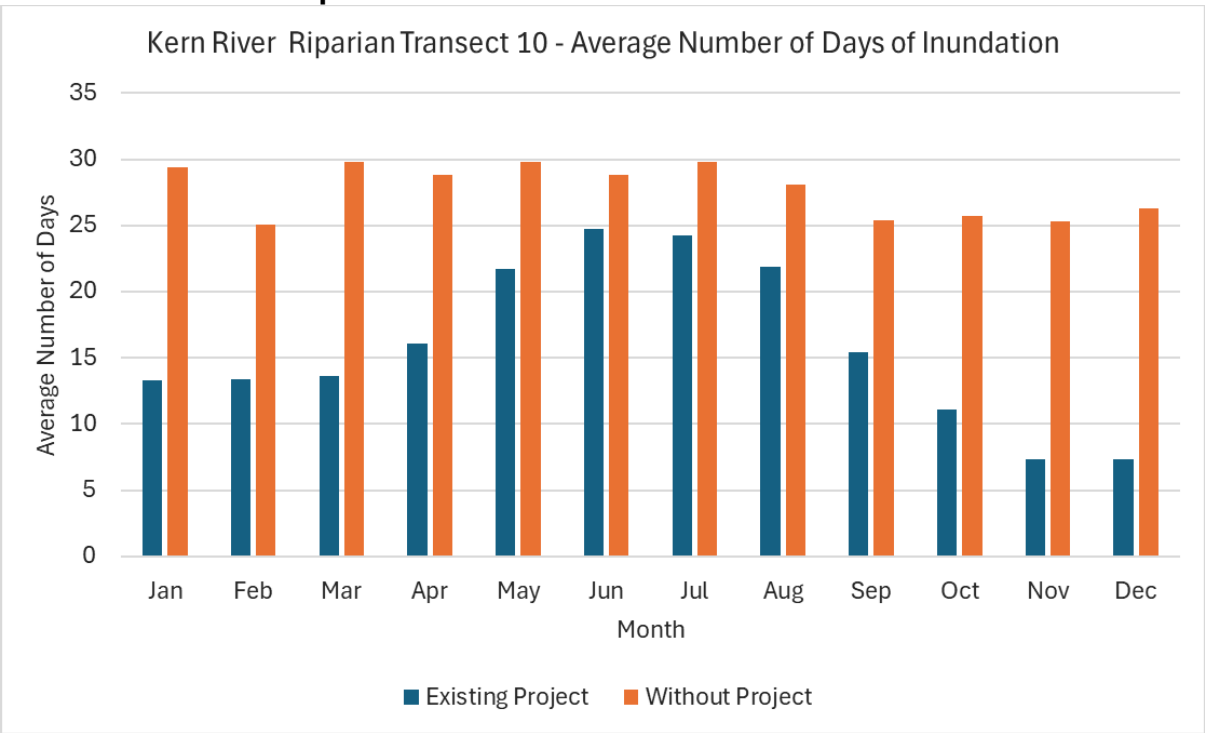


Figure C-30. Average number of days inundation at flows ≥ 1,631 cfs (Without-Project 2-yr recurrence interval), for the Kern River below Democrat Dam at Riparian Transect KT10

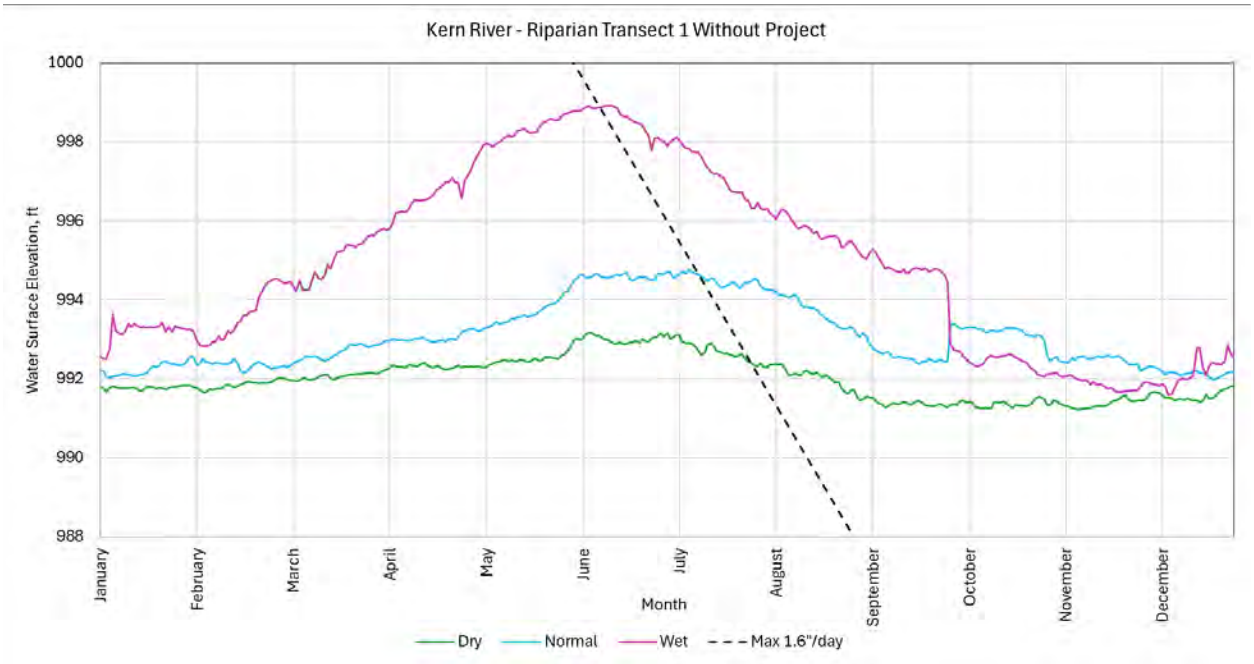


Figure C-31. Riparian Transect KT1 yearly water surface elevations by water year type for the 1999–2023 Period-of-Record for Release to Bypass Reach (top) and Project Inflow (bottom). Dotted line represents a maximum recession rate of 1.6 inches per day.

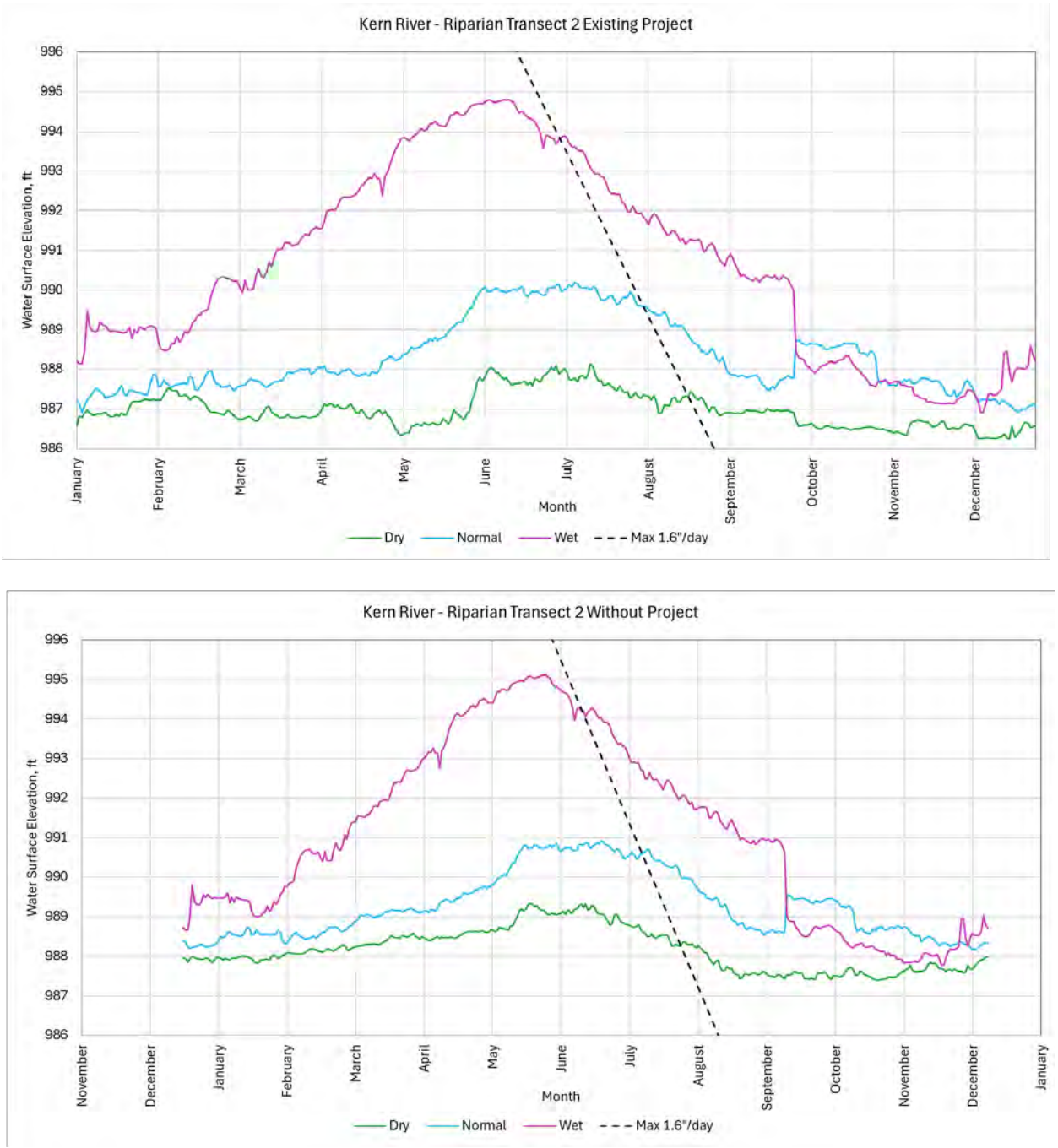


Figure C-32. Riparian Transect KT2 yearly water surface elevations by water year type for the 1999–2023 Period-of-Record for Release to Bypass Reach (top) and Project Inflow (bottom). Dotted line represents a maximum recession rate of 1.6 inches per day.

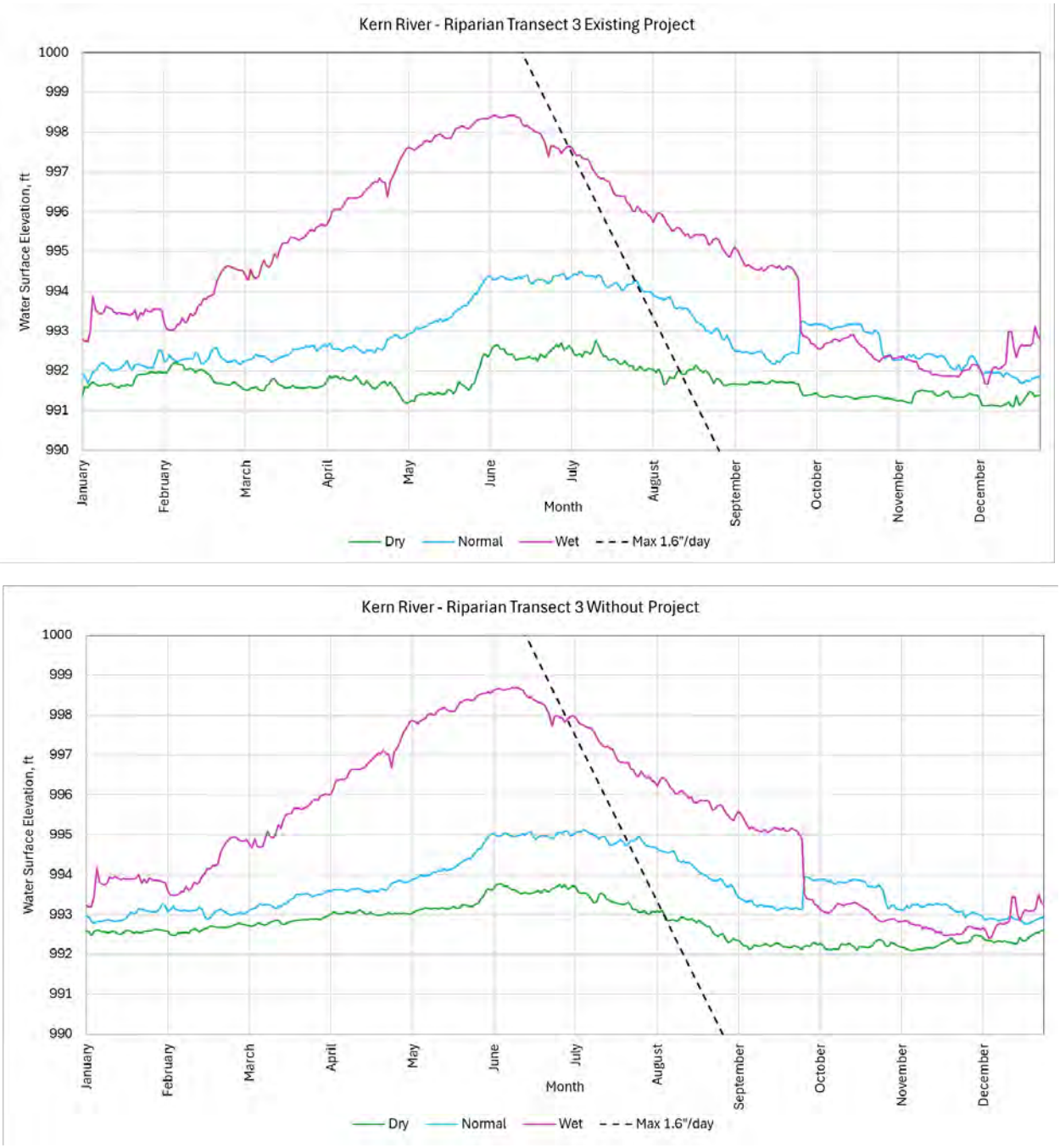


Figure C-33. Riparian Transect KT3 yearly water surface elevations by water year type for the 1999–2023 Period-of-Record for Release to Bypass Reach (top) and Project Inflow (bottom). Dotted line represents a maximum recession rate of 1.6 inches per day.

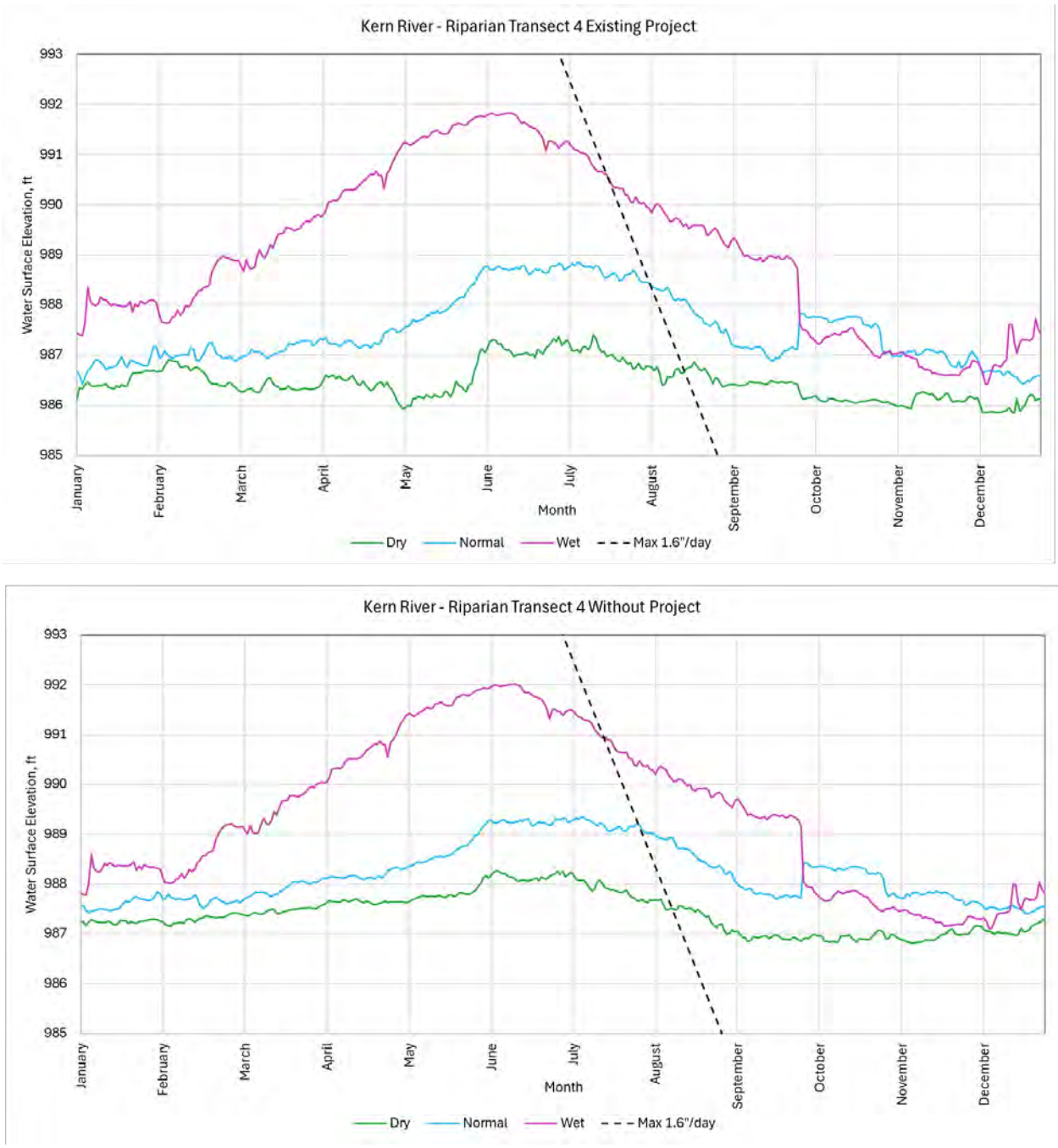


Figure C-34. Riparian Transect KT4 yearly water surface elevations by water year type for the 1999–2023 Period-of-Record for Release to Bypass Reach (top) and Project Inflow (bottom). Dotted line represents a maximum recession rate of 1.6 inches per day.

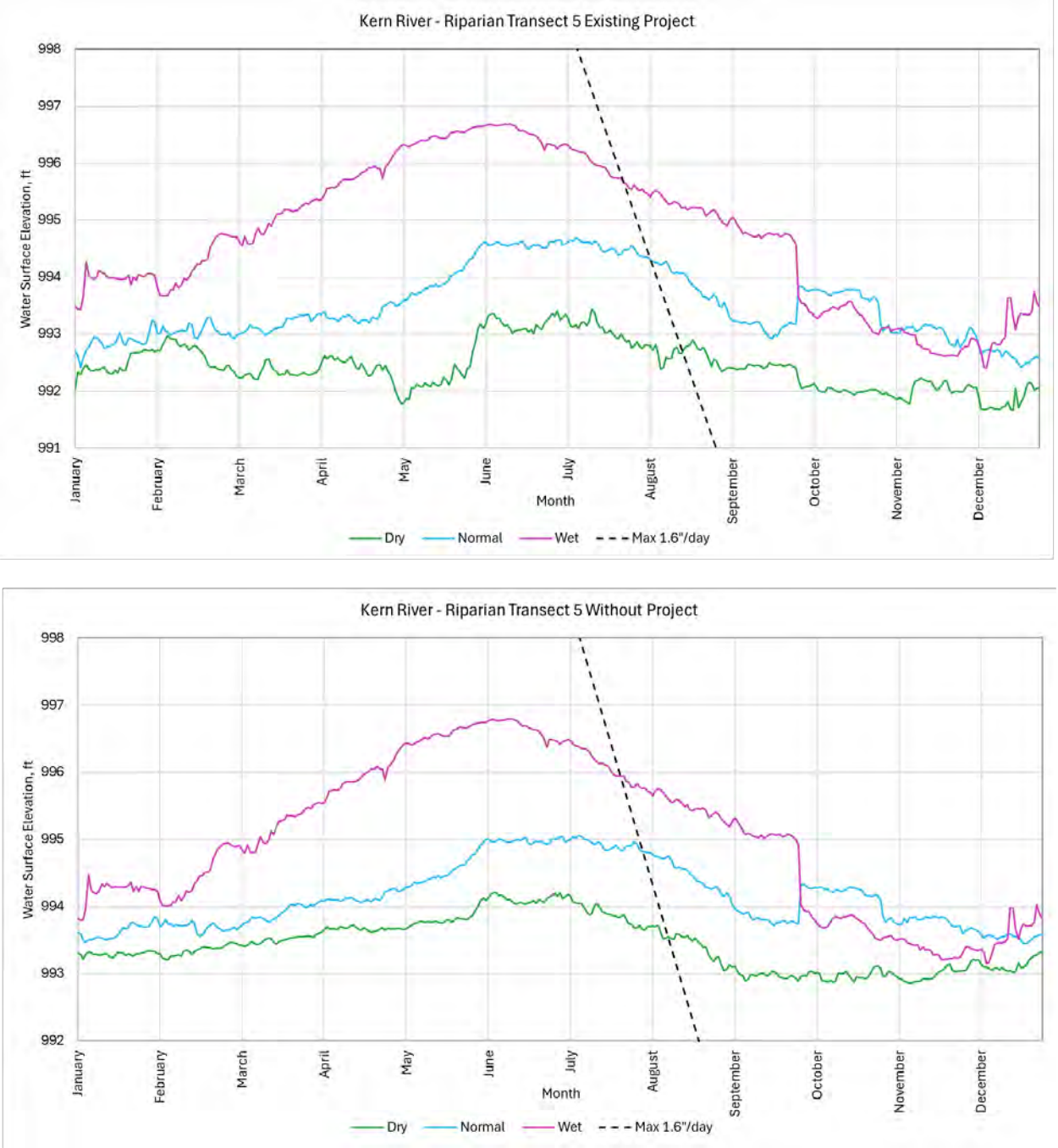


Figure C-35. Riparian Transect KT5 yearly water surface elevations by water year type for the 1999–2023 Period-of-Record for Release to Bypass Reach (top) and Project Inflow (bottom). Dotted line represents a maximum recession rate of 1.6 inches per day.

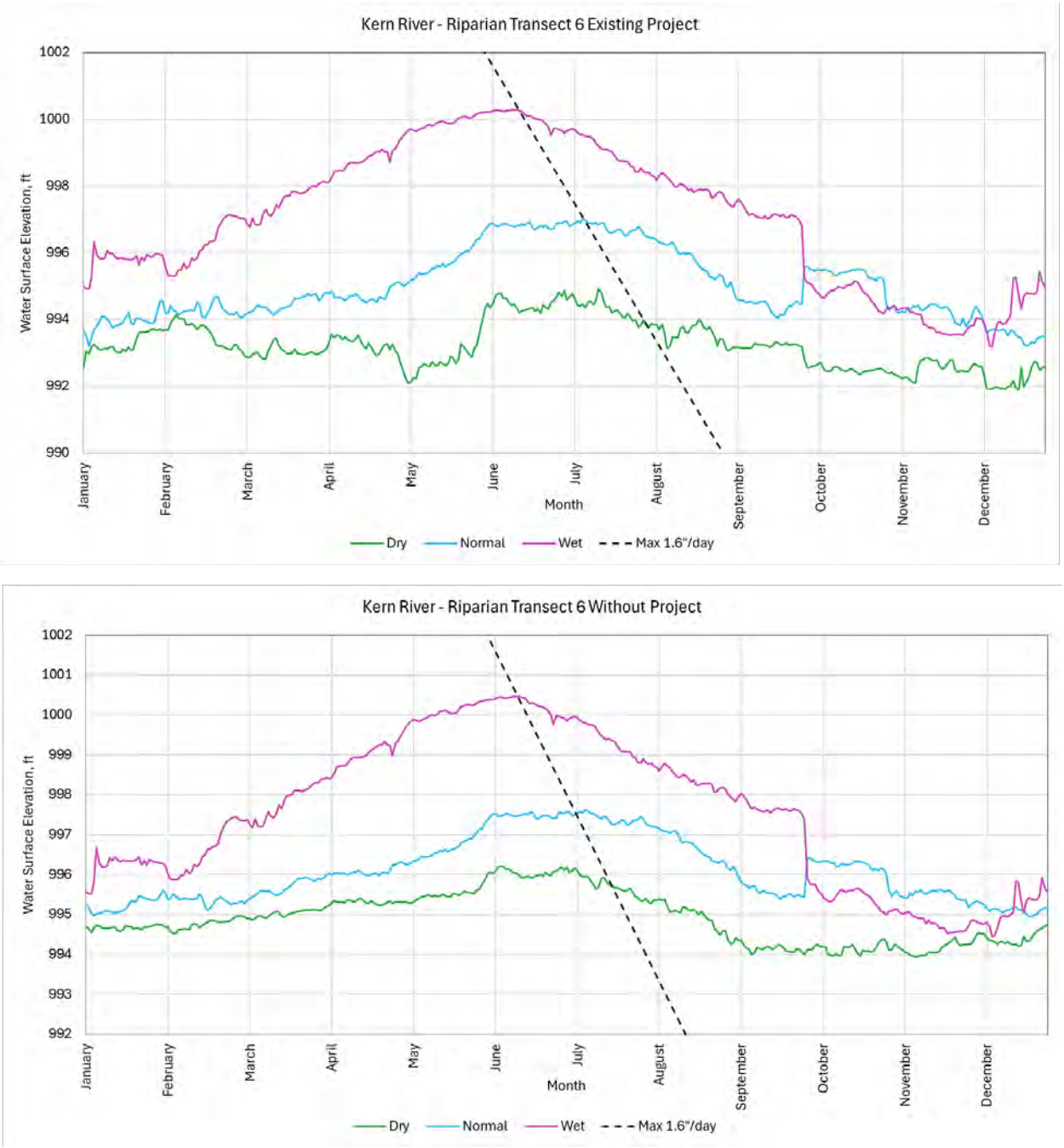


Figure C-36. Riparian Transect KT6 yearly water surface elevations by water year type for the 1999–2023 Period-of-Record for Release to Bypass Reach (top) and Project Inflow (bottom). Dotted line represents a maximum recession rate of 1.6 inches per day.

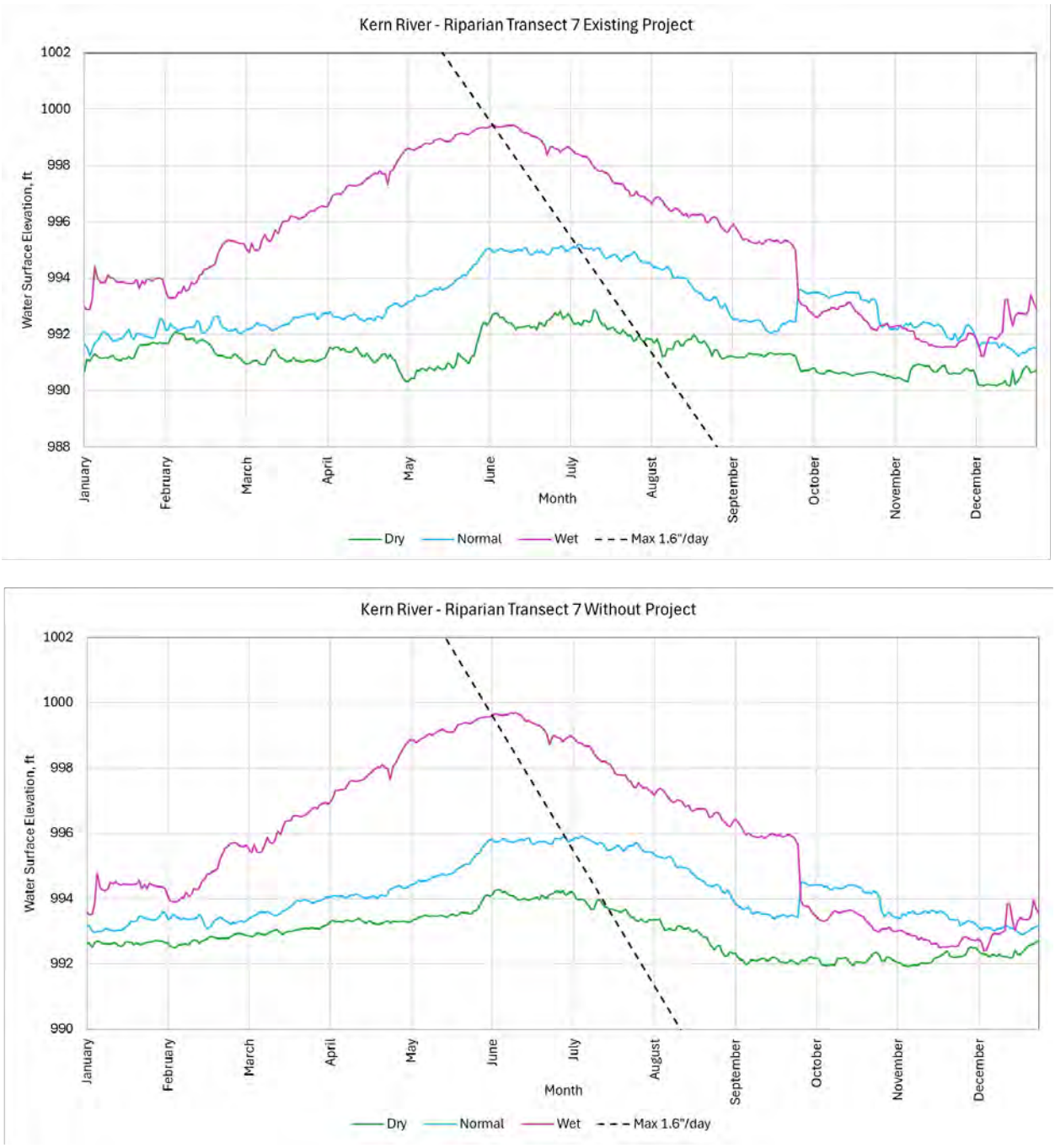


Figure C-37. Riparian Transect KT7 yearly water surface elevations by water year type for the 1999–2023 Period-of-Record for Release to Bypass Reach (top) and Project Inflow (bottom). Dotted line represents a maximum recession rate of 1.6 inches per day.

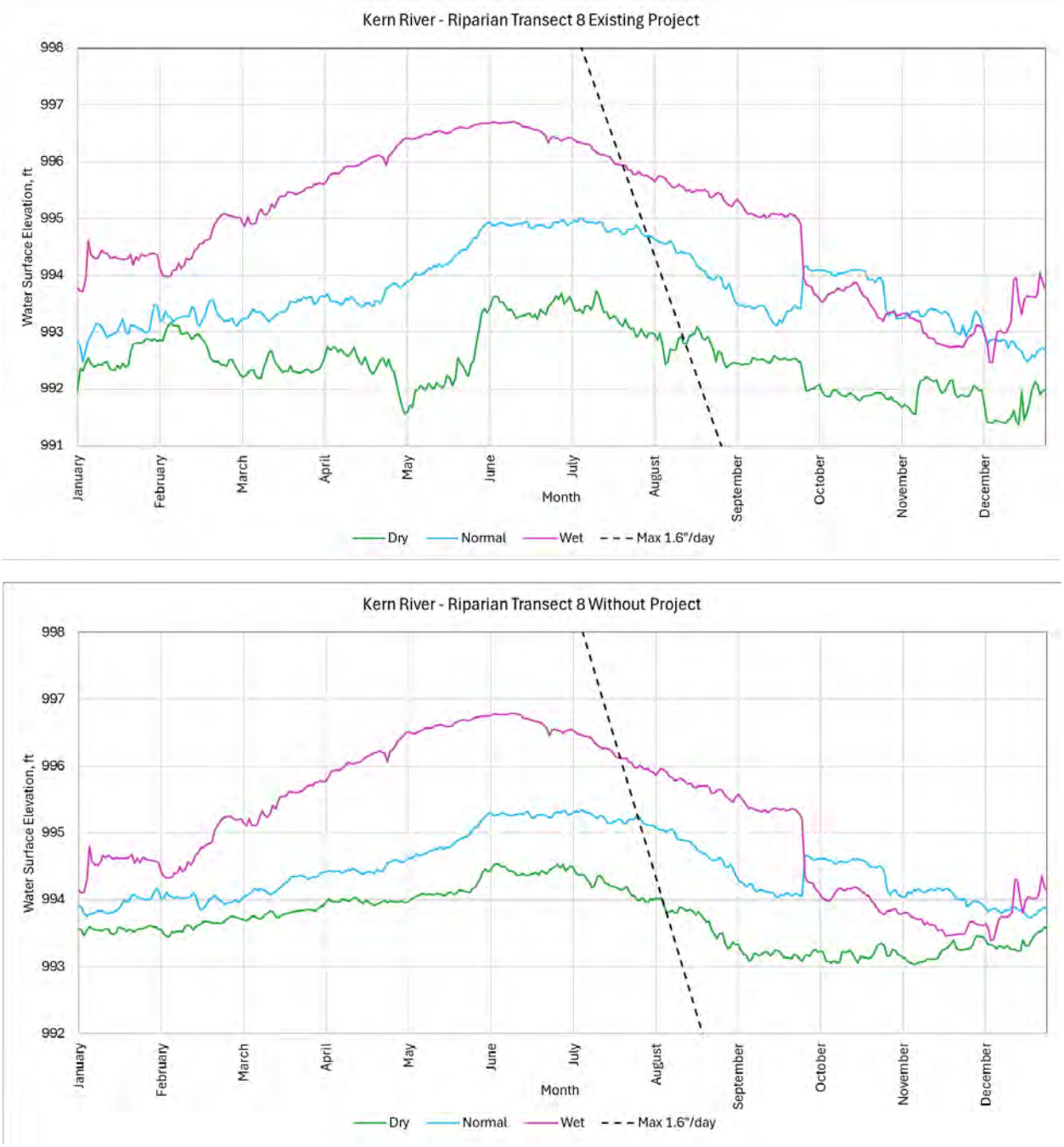


Figure C-38. Riparian Transect KT8 yearly water surface elevations by water year type for the 1999–2023 Period-of-Record for Release to Bypass Reach (top) and Project Inflow (bottom). Dotted line represents a maximum recession rate of 1.6 inches per day.

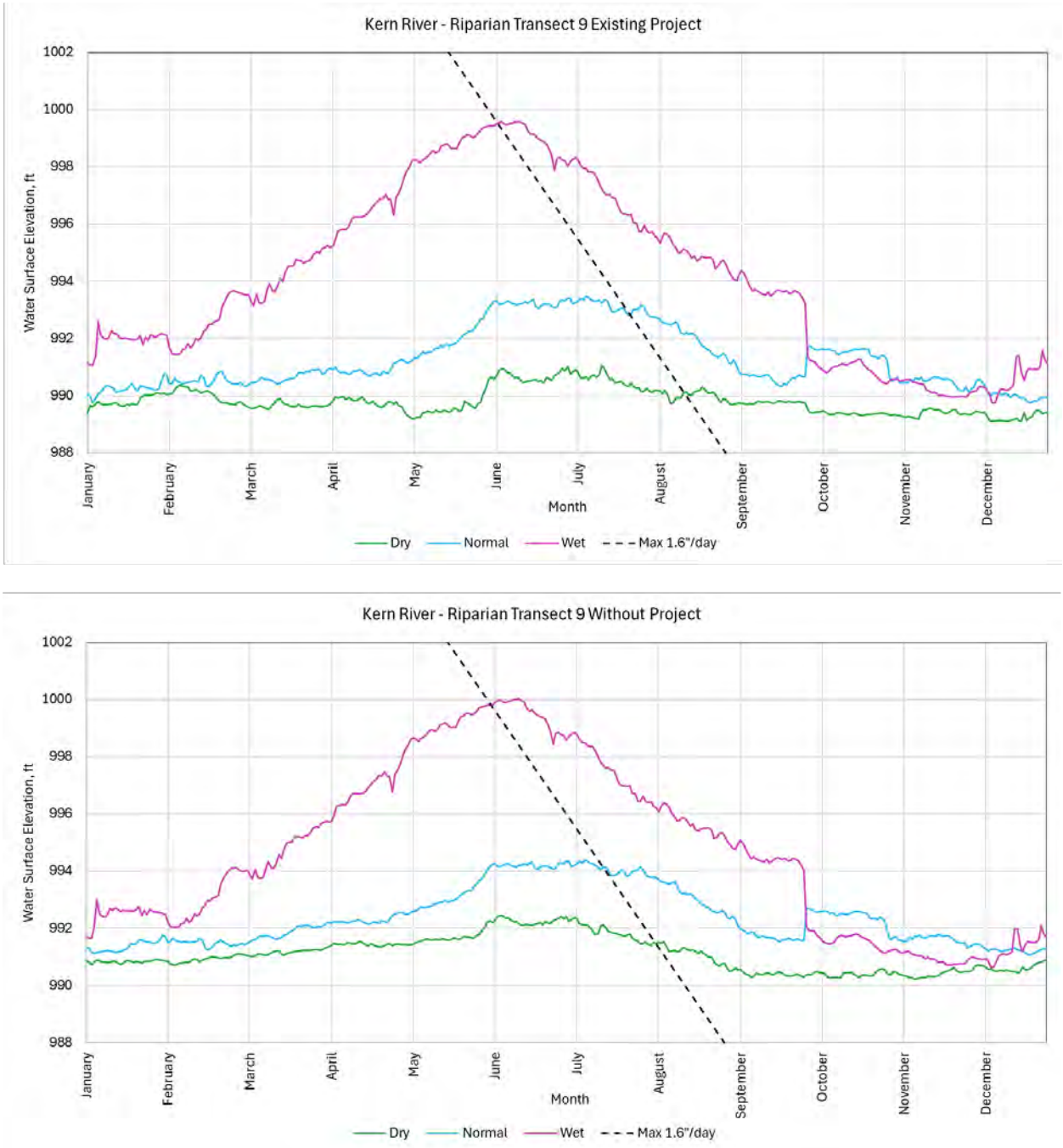
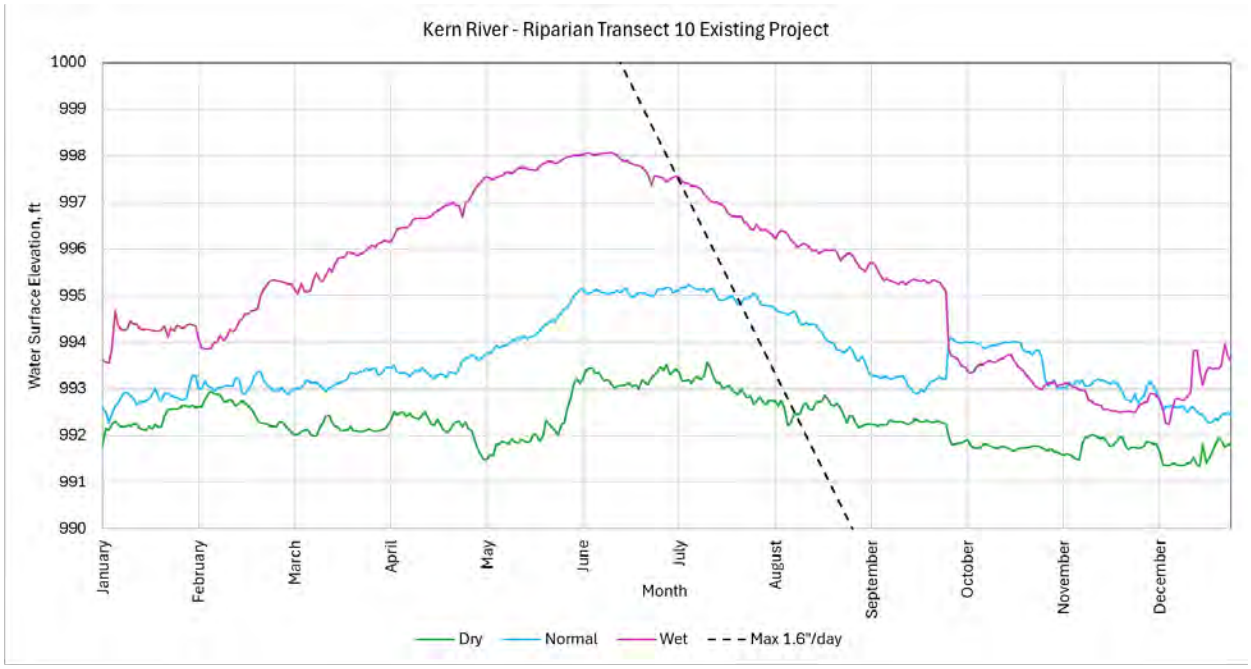


Figure C-39. Riparian Transect KT9 yearly water surface elevations by water year type for the 1999–2023 Period-of-Record for Release to Bypass Reach (top) and Project Inflow (bottom). Dotted line represents a maximum recession rate of 1.6 inches per day.



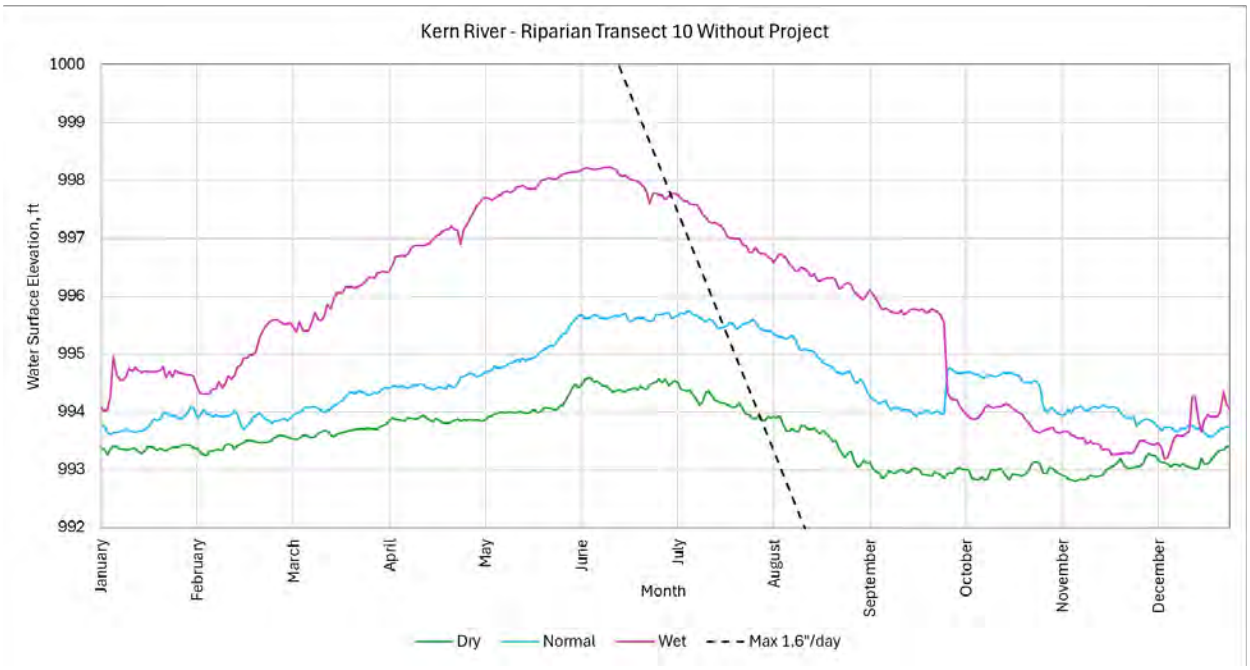


Figure C-40. Riparian Transect KT10 yearly water surface elevations by water year type for the 1999–2023 Period-of-Record for Release to Bypass Reach (top) and Project Inflow (bottom). Dotted line represents a maximum recession rate of 1.6 inches per day.

APPENDIX D

Life History Strategies of Dominant Woody Riparian Species Found in the Bypass Reach

Table D-1. Life History Strategies of Dominant Woody Riparian Species Found in the Bypass Reach

Attribute		Woody Species						
		Red willow (*Salix laevigata*)	**Narrowleaf willow (*Salix exigua*)**	**Goodding's willow (*Salix gooddingii*)**	**Mule-fat (*Baccharis salicifolia*)**	**Common buttonbush (*Cephalanthus occidentalis*)**	**California sycamore (*Platanus racemosa*)**	**Fremont cottonwood (*Populus fremontii*)**
Seed Initiation[1]								
Reproduction	**Flowering Timing**	December to June (Argus 2012a)	March to June (Argus 2012b)	March to April (Argus 2012c)	May to July (Karrfalt and Olson 2008)	June to September (Preston and Dempster 2012)	February to April (Baldwin et al. 2012)	March to June (Stella et al. 2006)
	Seed Dispersal Timing	Spring (CNPS 2024)	May to early June (Young and Clements 2003)	June to July (Young and Clements 2003)	May to July (Karrfalt and Olson 2008)	Fall (USDA-NRCS 2024)	February to March (Baldwin et al. 2012)	March to July depends on location (Baldwin et al. 2012, Stella et al 2006)
	Seed Dispersal Agent[2]	Anemochoric and hydrochoric	Anemochoric and hydrochoric	Anemochoric and hydrochoric	Anemochoric and hydrochoric	Anemochoric and hydrochoric	Primarily anemochoric, also hydrochoric and zoochoric	Hydrochoric and anemochoric
	Asexual Traits	Sprouts from shoot buds on lateral roots (Kindschy 1985)	Sprouts from underground shoot buds on lateral roots (CNPS 2024)	Buds on large branches and trunks, and underground structures (CNPS 2024)	Buds on small branches (CNPS 2024)	Buds on small branches (CNPS 2024)	Can reproduce from root crown.	Crown breakage and flood-related disturbance (e.g. tree fall) (Braatne et al. 1996)
Germination and Establishment[3]	**Seed Viability (in natural conditions)**	Remain viable for around 30 days (McBride and Strahan 1984)	Seeds remain viable for an average of 44 days (Stella et al. 2006)	Seeds remain viable for an average of 31 days (Stella et al. 2006)	1 to 2 weeks (McBride and Strahan 1984)	Unknown (Conner 2004)	Not a limiting factor.	1 to 3 weeks (as cited in Braatne et al. 1996)
	Germination	Within 24 hours (Karrenberg et al. 2002)	12 to 24 hours under proper conditions (Nellessen 2004)	Within 24 hours (Karrenberg et al. 2002)	7 to 15 days (Karrfalt and Olson 2008)	24 hours (Bonner 1974)	Germinates quickly in moist conditions.	24 hours in moist, bare soil (Braatne et al. 1996)
	Seedling Root Growth Rate (and Recession Rate Associated with Establishment)	Recession rate of 1 to 2.5 centimeters (cm) per day (Amlin and Rood 2002)	Recession rate of 1 to 2.5 cm per day (Amlin and Rood 2002)	Recession rate of 1 to 2.5 cm per day (Amlin and Rood 2002)	Growth rate of 2.17 cm per day (Glenn et al. 1998)	Moderate (USDA-NRCS 2024)	Similar to cottonwoods	Seedling root growth rate: 4 to 12 millimeters (mm)/day (as cited in Braatne et al. 1996); can reach 40 cm length in 30 days (Braatne et al. 1996) Recession rate: 2.5 to 4 cm/day (up to 10 cm/day) (Mahoney and Rood 1998; Amlin and Rood 2002; Roberts et al. 2002; Stella et al. 2006)

Attribute		Woody Species						
		Red willow (*Salix laevigata*)	**Narrowleaf willow (*Salix exigua)***	**Goodding's willow (*Salix gooddingii*)**	**Mule-fat (*Baccharis salicifolia*)**	**Common buttonbush (*Cephalanthus occidentalis*)**	**California sycamore (*Platanus racemosa*)**	**Fremont cottonwood (*Populus fremontii*)**
Dormant Season	**Rooting Depth of Sapling, first growing season**	40 to 60 cm (Karrenberg et al. 2002)	40 to 60 cm (Karrenberg et al. 2002)	40 to 60 cm (Karrenberg et al. 2002)	60 cm (Braudrick and Orr 2021)	35 cm (Tentative, found two plant store websites that said that, not primary sources)	Similar to cottonwoods	75 to 150 cm (Braatne et al. 1996)
Maturation[4]								
Age at Reproductive Maturity		2 years (CNPS 2024)	2 years (CNPS 2024)	2 years (CNPS 2024)	2 years (CNPS 2024)	2 years (CNPS 2024)	6 to 7 years	5 to 10 years (as cited in Braatne et al. 1996)
Rooting Depth of Mature Stands/Depth to Groundwater		Minimum 28 inches (USDA-NRCS 2024)	Minimum 20 inches (USDA-NRCS 2024)	Minimum 28 inches (USDA-NRCS 2024)	Minimum of 12 inches (USDA-NRCS 2024)	Minimum of 14 inches (USDA-NRCS 2024)	Less than 1m (USDA-NRCS 2024)	3 to 5+ meters (as cited in Braatne et al. 1996)
Lifespan		Stems survive 10 to 20 years (USDA-NRCS 2024)	Stems survive 10 to 20 years (USDA-NRCS 2024)	Stems survive 10 to 20 years (USDA-NRCS 2024)	Stems survive 10 to 20 years (USDA-NRCS 2024)	Stems survive 10 to 20 years (USDA-NRCS 2024)	200+ years	130+ years (as cited in Braatne et al. 1996)
Tree Height (mature tree)		Up to 4 meters (CNPS 2024)	2 to 4 meters (CNPS 2024)	Up to 30 meters (CNPS 2024)	Up to 3 meters (USDA-NRCS 2024)	Up to 6 meters (USDA-NRCS 2024)	20 to 35 meters (CNPS 2024)	12 to 35 meters (USDA-NRCS 2024)
DBH (mature tree)		10 to 15 cm (Hartwell et al. 2010)	Up to 13 cm (Nellessen 2004)	10 to 15 cm (Hartwell et al. 2010)	NA	NA	up to 1 meters (CNPS 2024)	30 to 150 cm (USDA-NRCS 2024)
Germination/Recruitment Microsite Characteristics								
Depth to Water Table or Elevation above Baseflow		Elevation above baseflow 0.6 to 3 meters (Mahoney and Rood 1998)	Elevation above baseflow 0.6 to 3 meters (Mahoney and Rood 1998)	Elevation above baseflow 0.6 to 3 meters (Mahoney and Rood 1998)	Elevation above baseflow 0.3 to 1.2 meters (River Partners 2008)	Elevation above baseflow 0.3 to 1.2 meters (River Partners 2008)	Maximum depth to water table, 1.5 to 4.5 meters (The Nature Conservancy [TNC] 1998)	Elevation above baseflow: 1 to 3 meters (Mahoney and Rood 1998; Roberts et al. 2002)
Substrate		Fine textured moist bare soil (CNPS 2024)	Fresh alluvium deposits with silt, sand, or gravelly soils (CNPS 2024)	Fine textured alluvium over subsurface of soils from silt to silty clay loam soil (USDA-NRCS 2024)	Adapted to course, medium, and fine soils (USDA-NRCS 2024)	Sandy, loamy sandy, or alluvial soil with a sandy or silty surface (USDA-NRCS 2024)	Sunny, coarse, medium textured substrate near water (USDA-NRCS 2024)	Bare, moist sandy, humous, or gravelly soils - with silts and clays.

Attribute	Woody Species						
	Red willow (*Salix laevigata*)	**Narrowleaf willow (*Salix exigua)***	**Goodding's willow (*Salix gooddingii*)**	**Mule-fat (*Baccharis salicifolia*)**	**Common buttonbush (*Cephalanthus occidentalis*)**	**California sycamore (*Platanus racemosa*)**	**Fremont cottonwood (*Populus fremontii*)**
Location on Floodplain	Lowland alluvial floodplains, shores, and bars (McBride and Strahan 1984)	Lowland alluvial floodplains, shores, and bars (Stella et al. 2006)	Lowland alluvial floodplains, shores, and bars (Stella et al. 2006)	Sand and gravel bars, alluvial surfaces near rivers and streams (McBride and Strahan 1984)	Lowland alluvial floodplains (USDA-NRCS 2024)	Sand and gravel bars, alluvial surfaces near rivers and streams (USDA-NRCS 2024)	Point bars, cut off channels, lower terraces

Notes: [1] Initiation refers to seed dispersal, germination, and initial seedling growth.
[2] Hydrochoric: water-dispersed; Anemochoric: wind-dispersed; Zoochoric: animal-dispersed.
[3] Establishment refers to the continued survival and growth of seedlings and saplings over several years until the tree or shrub reaches maturity.
[4] Maturity (sexual) occurs once a tree begins to flower and produce seed.

Key: cm = centimeter(s)
CNPS = California Native Plant Society
DBH = diameter at breast height
NA = Not Applicable
USDA-NRCS = U.S. Department of Agriculture Natural Resources Conservation Service

APPENDIX E

Timing of Flowering and Seed Dispersal for Common Woody Riparian Species in the Bypass Reach

Table E-1. Timing of Flowering and Seed Dispersal for Common Woody Riparian Species in the Bypass Reach

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
WILLOWS												
Goodding's Willow												
Flowering (Argus 2012c)												
Seed Dispersal (Young and Clements 2003)												
Red Willow												
Flowering (Argus 2012b)												
Seed Dispersal (USDA-NRCS 2024)												
Narrowleaf Willow												
Flowering (Argus 2012)												
Seed Dispersal (Young and Clements 2003)												
BACCHARIS												
Mule-fat												
Flowering (Karrfalt and Olson 2008)												
Seed Dispersal (Karrfalt and Olson 2008)												
CEPHALANTHUS												
Common Buttonbush												
Flowering (Preston and Dempster 2012)												
Seed Dispersal (USDA-NRCS 2024)												
SYCAMORE												
California Sycamore												
Flowering (Baldwin et al. 2012)												
Seed Dispersal (Baldwin et al. 2012)												

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
COTTONWOODS												
Freemont Cottonwood												
Flowering (Stella et al. 2006)												
Seed Dispersal (Stella et al. 2006)												

APPENDIX F

Special-Status Plants Known to Occur or Potentially Occurring in the Study Area

Table F-1. Special-Status Plants Known to Occur or Potentially Occurring in the Study Area

Scientific/Common Name	Federal/ State Status	Sequoia National Forest Status	CRPR	Blooming Period/ Fertile	Habitat	Likelihood for Occurrence
Known to Occur in the Vicinity of the Project						
Delphinium purpusii rose-flowered larkspur	–	FSCC	1B.3	April–May	A perennial herb that grows on rocky, often carbonate soils in chaparral, cismontane woodland, and pinyon and juniper woodland. Elevation: 1,000–4,470 feet.	**Known to occur.** • Nine populations of rose-flowered larkspur were identified in the study area during TERR 1 early season botanical surveys in April 2024. This includes: - Three small populations along the Conduit No. 3 Trail (DEPU_01–03); - One population along Flume No. 3 between Conduit No. 4 and 5 (DEPU_04); - One small population along the Lucas Creek Trail (DEPU_05); - A single individual along Stark Creek Trail (DEPU_06); - A single individual along Dougherty Creek Trail (DEPU_07) - A small population near Adit 14 & 15 (DEPU_08); and - A large population adjacent to the Overflow Spillway Trail east of the Kern No. 1 Forebay (DEPU_09). • CNDDB includes six additional prior records for rose-flowered larkspur located along Kern River in the vicinity of the Project[1]. An additional occurrence was recorded within the 1-mile buffer of the Project. These occurrences were recorded in 1933, 1969, 1972, 1982, 2005, and two occurrences in 2010.
May Potentially Occur in the Vicinity of the Project						
Calochortus striatus alkali mariposa lily	–	FSCC	1B.2	April–June	A perennial bulbiferous herb that grows on alkaline and mesic soils in chaparral, chenopod scrub, Mojavean desert scrub, and meadows and seeps. Elevation: 230–5,235 feet.	**May potentially occur.** The Project is within the geographic range and contains suitable habitat for this species. This species was not observed during botanical surveys in 2024 and 2025.
Camissonia integrifolia Kern River evening-primrose	–	FSCC	1B.3	April (May)	An annual herb that grows in chaparral and Mojavean desert scrub. Elevation: 2,295–3,935 feet.	**May potentially occur.** The Project is within the geographic range and contains suitable habitat for this species. This species was not observed during botanical surveys in 2024 and 2025.
Clarkia springvillensis Springville clarkia	FT/CE	–	1B.2	April–July	An annual herb that grows on granitic soils in chaparral, cismontane woodland, and valley and foothill grassland. Elevation: 805–4,005 feet.	**May potentially occur.** The Project is within the geographic range and contains suitable habitat for this species. This species was not observed during botanical surveys in 2024 and 2025.
Diplacus pictus (*Mimulus pictus*) calico monkeyflower	–	FSCC	1B.2	March–May	An annual herb found in granitic, disturbed areas in broad-leafed upland forest and cismontane woodland. Elevation: 330–4,770 feet.	**May potentially occur**. The Project is within the geographic range and contains suitable habitat for this species. This species was not observed during botanical surveys in 2024 and 2025. Based on review of FERC and Forest Service 1998, individuals were found north side of Kern River across from Democrat Hot Springs and near Richbar Day Use Area (*no GIS data available for this occurrence*). A CNDDB query yielded two records for this species in the vicinity of the Project: • A large polygon (1956) (generalized occurrence) encompassing Project facilities from the Lucas Creek Trail and downstream to Tunnel No. 14 northeast of Pacheco Creek; and • A 1983 detection adjacent to Democrat Dam Impoundment.

Scientific/Common Name	Federal/ State Status	Sequoia National Forest Status	CRPR	Blooming Period/ Fertile	Habitat	Likelihood for Occurrence
Eriastrium tracyi Tracy's eriastrum	–	FSCC	3.2	May–July	An annual herb found in chaparral, cismontane woodland, and valley and foothill grassland. Elevation: 1,035–5,840 feet.	**May potentially occur.** The Project supports suitable habitat and is within the elevational range of this species. This species was not observed during botanical surveys in 2024 and 2025.
Eschoscholzia lemmonii Tejon poppy	–	–	1B.1	March–May	An annual herb that grows in chenopod scrub and valley and foothill grassland. Elevation: 530–3,330 feet.	**May potentially occur.** The Project is within the geographic range and contains suitable habitat for this species. A CNDDB query yielded one record of this species located approximately 3 miles northwest of Kern River No. 1 Powerhouse. This species was not observed during botanical surveys in 2024 and 2025.
Fritillaria brandegeei Greenhorn fritillary	–	FSCC	1B.3	April–June	A perennial herb (bulbiferous) that found on granitic areas in lower montane coniferous forest. Elevation: 4,430–7,000 feet.	**May potentially occur**. The Project is within the geographic range and contains suitable habitat for this species. This species was not observed during botanical surveys in 2024 and 2025. A CNDDB query yielded one occurrence located near the confluence of Dougherty Creek and Kern River, in the vicinity of the Project. This occurrence was recorded in 1982.
Fritillaria striata striped adobe lily	CT	–	1B.1	February–April	A perennial herb (bulbiferous) that grows on clay soils in cismontane woodland and valley and foothill grassland. Elevation: 450–4,850 feet.	**May potentially occur.** The Project is within the geographic range and contains suitable habitat for this species. A CNDDB query yielded seven records within a 5-mile buffer of the Project. This species was not observed during botanical surveys in 2024 and 2025.
Hesperocyparis nevadensis Piute cypress	–	FSCC	1B.2	N/A	A perennial evergreen tree that grows in closed-cone coniferous forest, chaparral, cismontane woodland, and pinyon and juniper woodland. Elevation: 2,360–6,005 feet.	**May potentially occur.** The Project is within the geographic range and contains suitable habitat for this species. This species was not observed during botanical surveys in 2024 and 2025.
Heterotheca shevockii Shevock's golden aster	–	FSCC	1B.3	August–November	A perennial herb that grows in chaparral and cismontane woodland. Elevation: 760–3,000 feet.	**May potentially occur**. The Project is within the geographic range and contains suitable habitat for this species. This species was not observed during botanical surveys in 2024 and 2025. The query of NRIS/CNDDB query yielded two occurrences within the vicinity of the Project: • A 1996 detection adjacent to the Steel Flume trail (NRIS); and • A continuous polygon encompassing both sides of the Kern River from Conduit No 2 downstream to Tunnel No. 14 northeast of Pacheco Creek (CNDDB). Several USFS NRM records document occurrences of *Heterotheca shevockii* in the vicinity of the Project, including a 1996 record near the Steel Flume Trail and a more recent 2024 record provided in the LTBMU. However, the documented populations occur outside the botanical study area.
Leptosiphon serrulatus [= Linanthus serrulatus] Madera leptosiphon	–	–	1B.2	April–May	An annual herb that grows in cismontane woodland and lower montane coniferous forest. Elevation: 985–4,265 feet.	**May potentially occur**. The Project is within the geographic range and contains suitable habitat for this species. This species was not observed during botanical surveys in 2024 and 2025.
Monardella linoides ssp. *anemonoides* southern Sierra monardella	–	–	1B.3	June–August	A perennial herb found in chaparral, cismontane woodland, and lower montane coniferous forest. Elevation: 2,200–8,040 feet.	**May potentially occur**. The Project is within the geographic range and contains suitable habitat for this species. This species was not observed during botanical surveys in 2024 and 2025. A CNDDB query yielded one occurrence in the vicinity of the Project, a generalized polygon encompassing the Democrat Diversion Dam impoundment and the Willow Spring Creek Road (also referred to as Democrat Dam Road). This occurrence was recorded in 1935.

Scientific/Common Name	Federal/ State Status	Sequoia National Forest Status	CRPR	Blooming Period/ Fertile	Habitat	Likelihood for Occurrence
Navarretia setiloba Piute Mountains navarretia	–	–	1B.1	April–July	An annual herb that grows on clay or gravelly loam soils in cismontane woodland, pinyon and juniper woodland, and valley and foothill grassland. Elevation: 950–7,000 feet.	**May potentially occur.** The Project supports suitable habitat and is within the elevational range of this species. This species was not observed during botanical surveys in 2024 and 2025. A CNDDB query yielded three records of this species within a 5-mile buffer of the Project.
Opuntia treleasei Bakersfield cactus	FE/CE	–	1B.1	April–May	A perennial cactus that grows on sandy or gravelly soils in chenopod scrub, cismontane woodland, and valley and foothill grassland. Elevation: 400–4,830 feet.	**May potentially occur.** The Project supports suitable habitat and is within the elevational range of this species. This species was not observed during botanical surveys in 2024 and 2025. A CNDDB query identified one occurrence in the vicinity of the Project along the Kern River approximately 0.25 mile west of Stark Creek Road, recorded in 2010. Occurrence information was updated to include a July 2024 USFS NRM record documenting an *Opuntia treleasei* population located outside the botanical study area.
Pseudobahia peirsonii San Joaquin adobe sunburst	FT/CE	–	1B.1	February–April	An annual herb that grows on adobe clay soils in cismontane woodland and valley and foothill grassland. Elevation: 295–2,670 feet.	**May potentially occur.** The Project supports suitable habitat and is within the elevational range of this species. A CNDDB query yielded three records within a 5-mile buffer of the Project. This species was not observed during botanical surveys in 2024 and 2025.
Stylocline citreolum oil neststraw	–	–	1B.1	March–April	An annual herb that grows on clay soils in chenopod scrub, coastal scrub, and valley and foothill grassland. Only known extant populations are from the interior coast ranges. Elevation: 170–1,330 feet.	**May potentially occur.** The Project supports suitable habitat and is within the elevational range of this species. This species was not observed during botanical surveys in 2024 and 2025.
Viburnum ellipticum oval-leaved viburnum	–	FSCC	2B.3	May–June	A perennial deciduous shrub that grows in chaparral, cismontane woodland, and lower montane coniferous forest. Elevation: 705–4,595 feet.	**May potentially occur.** The Project supports suitable habitat and is within the elevational range of this species. This species was not observed during botanical surveys in 2024 and 2025.
Unlikely to Occur in the Vicinity of the Project						
Calochortus palmeri var. *palmeri* Palmer's mariposa-lily	–	FSCC	1B.2	April–July	A perennial bulbiferous herb that grows on mesic soils in chaparral, lower montane coniferous forests, and in meadows and seeps. Elevation 2,330–7,840 feet in elevation.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Caulanthus californicus California jewelflower	FE/CE	–	1B.1	February–May	An annual herb that grows on sandy soils in chenopod scrub, pinyon and juniper woodland, and valley and foothill grassland. Extirpated from the San Joaquin Valley, now known only from Santa Barbara canyon, Carrizo Plain, and the Kreyenhagen Hills. Elevation: 200–3,300 feet.	**Unlikely to occur.** The Project is outside of the geographic range for this species.
Cordylanthus eremicus ssp. *kernensis* Kern Plateau bird's-beak	–	FSCC	1B.3	July–September	A hemiparasitic annual herb that grows in Great Basin scrub, Joshua tree "woodland", pinyon and juniper woodland, and upper montane coniferous forest. Elevation: 5,495–9,845 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Eremalche parryi ssp. *kernensis* Kern mallow	FE	–	1B.2	January–May	An annual herb that grows on dry and open sandy to clay soils in chenopod scrub, pinyon and juniper woodland, and valley and foothill grassland; often found at edge of balds. Elevation: 230–4,300 feet.	**Unlikely to occur.** The Project is outside of the geographic range for this species.
Layia leucopappa Comanche Point layia	–	–	1B.1	March–April	An annual herb that grows in chenopod scrub and valley and foothill grassland, found only in Kern County. Elevation: 330–1,170 feet.	**Unlikely to occur.** The Project is outside of the geographic range for this species.

Scientific/Common Name	Federal/ State Status	Sequoia National Forest Status	CRPR	Blooming Period/ Fertile	Habitat	Likelihood for Occurrence
Monolopia (=Lembertia) congdonii San Joaquin woolly-threads	FE	–	1B.2	February–May	An annual herb that grows in chenopod scrub and sandy valley and foothill grassland. Elevation: 200–2,670 feet.	**Unlikely to occur.** The Project is outside of the geographic range for this species. Populations in the lower Kern River are believed to be extirpated (USFWS 1998).
Streptanthus cordatus var. *piutensis* Piute Mountains jewel-flower	–	FSCC	1B.2	May–July	A perennial herb that grows on clay and metamorphic soils in broad-leafed upland forest, closed-cone coniferous forest, and pinyon and juniper woodland. Elevation: 3,595–5,990 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is outside of the elevational range of this species.
Symphyotrichum defoliatum San Bernardino aster	–	FSCC	1B.2	July–November	A perennial rhizomatous herb that grows on streambanks in cismontane woodland, coastal scrub, lower montane coniferous forest, meadows and seeps, marshes and swamps, and valley and foothill grassland (vernally mesic). Elevation: 5–6,695 feet.	**Unlikely to occur.** The Project is outside of the geographic range for this species.
Astragalus ertterae Walker Pass milk-vetch	–	FSCC	1B.3	April–May	A perennial herb that grows on granitic, sandy soils in pinyon and juniper woodland. Elevation: 5,595–6,235 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Astragalus lentiginosus var. *kernensis* Kern Plateau milk-vetch	–	FSCC	1B.2	June–July	A perennial herb that grows on sandy soils in meadows and seeps, and subalpine coniferous forest. Elevation: 7,350–9,025 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Astragalus shevockii Little Kern (Shevock's) milk-vetch	–	FSCC	1B.3	June–July	A perennial herb that grows on granitic and sandy soils in upper montane coniferous forest. Elevation: 6,200–6,445 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Astragalus subvestitus Kern County milk-vetch	–	FSCC	4.3	June–July	A perennial herb that grows on gravelly and sandy soils in Great Basin scrub, meadows and seeps, and pinyon and juniper woodland. Elevation: 7,645–9,025 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Atriplex tularensis Bakersfield saltbush	CE	–	1A	June–October	An annual herb that grows in chenopod scrub. Elevation: 295–655 feet.	**Unlikely to occur.** The Project is outside of the geographic range for this species.
Boechera evadens hidden rockcress	–	FSCC	1B.3	May–August	A perennial herb that grows on rocky soils in upper montane coniferous forest. Elevation: 8,400–9,350 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Boechera tularensis Tulare rockcress	–	FSCC	1B.3	June–July	A perennial herb that grows along slopes and roadsides on rocky soils in subalpine coniferous forest and upper montane coniferous forest. Elevation: 5,990–10,990 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Botrychium crenulatum scalloped moonwort	–	FSCC	2B.2	June–September	A perennial rhizomatous herb that grows in bogs and ferns, lower montane coniferous forest, meadows and seeps, marshes and swamps (freshwater), and upper montane coniferous forest. Elevation: 4,160–10,760 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Calochortus westonii Shirley Meadows star-tulip (mariposa lily)	–	FSCC	1B.2	May–June	A perennial herb (bulbiferous) that grows on granitic soils in broad-leafed upland forest, lower montane coniferous forest, and meadows and seeps. Elevation: 4,920–6,905 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Calyptridium pygmaeum Pygmy pussypaws	–	FSCC	1B.2	June–August	An annual herb that grows on gravelly and sandy soils in subalpine coniferous forest and upper montane coniferous forest. Elevation: 6,495–10,205 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Carlquistia muirii Muir's tarplant	–	FSCC	1B.3	July–August	A perennial rhizomatous herb that grows on granitic soils in chaparral (montane), lower montane coniferous forest, and upper montane coniferous forest. Elevation: 2,475–8,205 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.

Scientific/Common Name	Federal/ State Status	Sequoia National Forest Status	CRPR	Blooming Period/ Fertile	Habitat	Likelihood for Occurrence
Cirsium crassicaule slough thistle	–	–	1B.1	May–August	An annual/perennial herb that grows in chenopod scrub, marshes, and swamps (sloughs), and riparian scrub. Elevation: 10–330 feet.	**Unlikely to occur.** The Project does not contain suitable habitat for this species.
Clarkia tembloriensis ssp. *calientensis* Vasek's Clarkia	–	–	1B.1	April	An annual herb that grows in valley and foothill grassland. Elevation: 900–1,640 feet.	**Unlikely to occur.** The Project is outside of the geographic range for this species.
Cryptantha incana Tulare cryptantha	–	FSCC	1B.3	July–August	An annual herb that grows on gravelly soils in lower montane coniferous forests. Elevation: 4,690–7,055 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Deinandra mohavensis Mojave tarplant	–	FSCC	1B.3	June–October	An annual herb that grows on mesic soils in chaparral, coastal scrub, and riparian scrub. Elevation: 2,100–5,250 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Delphinium inopinum Unexpected larkspur	–	FSCC	4.3	May–July	A perennial herb that grows on metamorphic and rocky soils in upper montane coniferous forests. Elevation: 6,200–9,185 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Dicentra nevadensis Sierra (Tulare County) bleeding heart	–	FSCC	4.3	June–August	A perennial rhizomatous herb that grows in alpine boulder and rock fields, and subalpine coniferous forest (gravelly, sandy, openings). Elevation: 7,220–10,005 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Erigeron aequifolius Hall's daisy (fleabane)	–	FSCC	1B.3	June–August	A perennial rhizomatous herb that grows on granitic and rocky soils in broad-leafed upland forest, lower montane coniferous forest, pinyon and juniper woodland, and upper montane coniferous forest. Elevation: 4,920–8,005 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Erigeron multiceps Kern River daisy	–	FSCC	1B.2	June–September	A perennial herb that grows in meadows and seeps and upper montane coniferous forest (openings). Elevation: 4,920–8,315 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Eriogonum breedlovei var. *breedlovei* Breedlove's (Piute) buckwheat	–	FSCC	1B.2	June–August	A perennial herb that grows on carbonate soils in pinyon and juniper woodland and upper montane coniferous forest. Elevation: 6,200–8,500 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Eriogonum ovalifolium var. *monarchense* monarch buckwheat	–	FSCC	1B.1	June–August	A perennial herb that grows on carbonate, rocky, and sandy soils in Mojavean desert scrub and pinyon and juniper woodland. Elevation: 5,905–5,955 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Erythranthe discolor Two-colored monkey flower	–	FSCC	4.2	May–July	An annual herb that grows on granitic soils in cismontane woodland, great basin scrub, lower montane coniferous forests, meadows and seeps, pinyon juniper woodland, and upper montane coniferous forests. Elevation: 4,495–8,105	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Gilia yorkii Boyden Cave gilia	–	FSCC	1B.1	May–July	An annual herb that grows on carbonate soils in chaparral and cismontane woodland. Elevation: 4,230–6,005 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Githopsis tenella tube flower bluecup	–	FSCC	1B.3	April–June	An annual herb that grows on mesic and serpentinite soils in chaparral and cismontane woodland. Elevation: 1,065–6,235 feet.	**Unlikely to occur.** The Project does not contain suitable habitat for this species.
Helodium blandowii Blandow's bog moss	–	FSCC	2B.2	N/A	A moss that grows on damp soil in meadows and seeps and subalpine coniferous forest. Elevation: 6,110–8,860 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.

Scientific/Common Name	Federal/ State Status	Sequoia National Forest Status	CRPR	Blooming Period/ Fertile	Habitat	Likelihood for Occurrence
Heterotheca monarchensis Monarch golden aster	–	FSCC	1B.1	May–October	A perennial herb that grows on carbonate soils in cismontane woodland. Elevation: 3,595–6,070 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Horkelia tularensis Kern Plateau horkelia	–	FSCC	1B.3	June–August	A perennial herb that grows on rocky soils in upper montane coniferous forest. Elevation: 7,400–9,435 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Hulsea brevifolia short-leaved hulsea	–	FSCC	1B.2	May–August	A perennial herb that grows on granitic, gravelly, sandy, and volcanic soils in lower montane and upper montane coniferous forest. Elevation: 4,920–10,500 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Hulsea vestita ssp. *pygmaea*	–	FSCC	1B.3	June–October	A perennial herb that grows on granitic and gravelly soils in alpine boulder and rock field, and subalpine coniferous forests.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Ivesia campestris field ivesia	–	FSCC	1B.2	May–August	A perennial herb that grows in meadows and seeps (edges), subalpine coniferous forest, and upper montane coniferous forest. Elevation: 6,480–11,140 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Lewisia disepala Yosemite Lewisia	–	FSCC	1B.2	March–June	A perennial herb that grows on granitic and sandy soils in lower montane coniferous forest, pinyon and juniper woodland, and upper montane coniferous forest. Elevation: 3,395–11,485 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Madia radiata showy madia	–	–	1B.2	March–May	An annual herb that grows in cismontane woodland and valley and foothill grassland. Elevation: 80–3,985 feet.	**Unlikely to occur.** The Project is outside of the geographic range for this species.
Meesia uliginosa Meesia moss	–	FSCC	2B.2	July–October	A moss that grows in bogs and fens, meadows and seeps, subalpine coniferous forest, and upper montane coniferous forest. Elevation: 3,970–9,200 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Mielichhoferia shevockii Shevock's copper moss	–	FSCC	1B.2	N/A	A moss that grows in cismontane woodland (mesic, metamorphic, rock). Elevation: 2,460–4,595 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Navarretia peninsularis Baja navarretia	–	FSCC	1B.2	June–August	An annual herb that grows on mesic soils in chaparral (openings), lower montane coniferous forest, meadows and seeps, and pinyon and juniper woodland. Elevation: 4,920–7,545 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Nemacladus calcaratus Chimney Creek nemacladus	–	FSCC	1B.2	May–June	An annual herb that grows on flats and granitic soils in pinyon and juniper woodland. Elevation: 6,235–6,890 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Nemacladus twisselmannii Twisselmann's nemacladus	–	FSCC	1B.2	July	An annual herb that grows on granitic, sandy, or rocky soils in upper montane coniferous forest. Elevation: 7,350–8,040 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Oreonana purpurascens purple mountain-parsley	–	FSCC	1B.2	May–June	A perennial herb that grows on metamorphic soils in broad-leafed upland forest, subalpine coniferous forest, and upper montane coniferous forest. Elevation: 7,860–9,400 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Oreonana vestita Woolly mountain-parsley	–	FSCC	1B.3	March–September	A perennial herb that grows on gravelly and talus soils in lower montane coniferous forest, subalpine coniferous forest, and upper montane coniferous forest. Elevation: 5,300–11,485 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.

Scientific/Common Name	Federal/ State Status	Sequoia National Forest Status	CRPR	Blooming Period/ Fertile	Habitat	Likelihood for Occurrence
Orthotrichum spjutii Spjut's bristle moss	–	FSCC	1B.3	N/A	A moss that grows on granitic and rocky soils in lower montane coniferous forest, pinyon and juniper woodland, subalpine coniferous forest, and upper montane coniferous forest. Elevation: 6,890–7,875 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Phacelia nashiana Charlotte's phacelia	–	FSCC	1B.2	March–June	An annual herb that grows on granitic and sandy soils in Joshua tree "woodlands", Mojavean desert scrub, and pinyon and juniper woodland. Elevation: 1,970–7,220 feet.	**Unlikely to occur.** The Project does not contain suitable habitat for this species.
Phacelia novenmillensis Nine Mile Canyon phacelia	–	FSCC	1B.2	May–June	An annual herb that grows on gravelly and sandy soils in broad-leafed upland forest, cismontane woodland, pinyon and juniper woodland, and upper montane coniferous forest. Elevation: 5,395–8,660 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Ribes menziesii var. ixoderme aromatic canyon gooseberry	–	–	1B.2	April	A perennial deciduous scrub that grows in chaparral and cismontane woodland. Elevation: 2,000–3, 805 feet.	**Unlikely to occur.** The Project does not contain suitable habitat for this species.
Sidalcea multifida cut-leaf checkerbloom	–	FSCC	2B.3	May–September	A perennial herb that grows in Great Basin scrub, lower montane coniferous forest, meadows and seeps, and pinyon and juniper woodland. Elevation: 5,740–9,185 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Sidotheca caryophylloides chickweed oxytheca	–	FSCC	4.3	July–September	An annual herb that grows on sandy soil in lower montane coniferous forests. Elevation: 3,655–8,530 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Streptanthus fenestratus Tehipite Valley jewel-flower	–	FSCC	1B.1	May–July	An annual herb that grows in lower montane coniferous forest and upper montane coniferous forest. Elevation: 3,495–5,740 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.
Trifolium kingii ssp. *dedeckerae (T. dedeckerae)* Dedecker's clover	–	FSCC	1B.3	May–July	A perennial herb that grows on granitic and rocky soils in lower montane coniferous forest, pinyon and juniper woodland, subalpine coniferous forest, and upper montane coniferous forest. Elevation: 6,890–11,485 feet.	**Unlikely to occur.** The Project does not contain suitable habitat and is out of the elevational range of this species.

Key: CNDDB = California Natural Diversity Database
CRPR = California Rare Plant Rank
NRIS = Natural Resource Information System

Federal Status
FC = Federal Candidate Species
FE = Federal Endangered
FT = Federal Threatened
FPD = Federal Proposed for Delisting
FPT, FPE = Federal Proposed Threatened/Endangered

Forest Service Status
FSCC = Sequoia National Forest Species of Conservation Concern

State Status
CFP = California Fully Protected
CSC = California Species of Special Concern
CCT, CCE = State Candidate Threatened/Endangered
CE = California Endangered
CT = California Threatened

CRPR = California Native Plant Society Rare Plant Rank
- CRPR 1B = rare, threatened or endangered in California and elsewhere
- CRPR 2B = rare in California but more common elsewhere
- 3 = need more information
- 4 = plants of limited distribution; a watch list
  - _.1 = Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)
  - _.2 = Moderately threatened in California (20–80% occurrences threatened)
  - _.3 = Not very threatened in California (<20% of occurrences threatened or no current threats known)

APPENDIX G

Representative Photographs of Rose-Flowered Larkspur (*Delphinium purpusii*) Populations in the Study Area

Photo G-1. Rose-flowered larkspur (*Delphinium purpusii*) growing along a granite slope from population DEPU_01.

Photo G-2. Rose-flowered larkspur (*Delphinium purpusii*) growing along a granite slope below a conduit from population DEPU_03.

Photo G-3. Rose-flowered larkspur (*Delphinium purpusii*) growing along a granite slope from population DEPU_05.

Photo G-4. Rose-flowered larkspur (*Delphinium purpusii*) growing along a granite slope from population DEPU_06.

Photo G-5. Rose-flowered larkspur (*Delphinium purpusii*) growing on a rock wall from populations DEPU_07.

Photo G-6. Rose-flowered larkspur (*Delphinium purpusii*) growing on a rock wall near a flume from population DEPU_08.

Photo G-7. Rose-flowered larkspur (*Delphinium purpusii*) growing in granite cobble from population DEPU_09.

APPENDIX H

CNDDB Forms for Rose-Flowered Larkspur (*Delphinium purpusii*) Populations in the Study Area (CONFIDENTIAL)

CONFIDENTIAL INFORMATION

The following appendix is being withheld from public disclosure in accordance with applicable regulations. It contains details on the locations of special-status biological resources and qualifies as Confidential Information (18 Code of Federal Regulations § 385.1112). Disclosure of such information could be harmful to these resources. To further understand FERC's regulations regarding confidential filings, visit: https://www.ferc.gov/foia.

Appendix H CNDDB Forms for Rose-Flowered Larkspur (*Delphinium pupusii*) Populations in the Study Area (CONFIDENTIAL)

Appendix H will not be distributed to the general public. Documents containing Confidential Information may be requested by entities and organizations with jurisdiction over these resources. To request copies, please contact Kadi Whiteside, SCE Relicensing Project Manager at (626) 807-3641 / karen.whiteside@sce.com.

APPENDIX I

Comprehensive List of Plants Identified During Botanical Surveys in the Study Area

Table I-1. Comprehensive List of Plants Identified During Botanical Surveys in the Study Area

Scientific Name	Common Name	Native/ Non-Native	Family	Status
Special Status Species				
Delphinium purpusii	Kern county larkspur	Native	Ranunculaceae	California Rare Plant Rank 1B.3
Target Non-native Plant Species				
Bromus rubens	Red brome	Non-native	Poaceae	Cal-IPC rating: high
Bromus tectorum	Cheatgrass	Non-native	Poaceae	Cal-IPC rating: high
Onopordum acanthium	Scotch thistle	Non-native	Asteraceae	Cal-IPC rating: high
Polypogon monspeliensis	Rabbit foot grass	Non-native	Poaceae	Cal-IPC rating: limited
Verbascum thapsus	Common mullein	Non-native	Scrophulariaceae	Cal-IPC rating: limited
All Other Plant Species				
Achillea millefolium	Yarrow	Native	Asteraceae	–
Achyrachaena mollis	Blow wives	Native	Asteraceae	–
Acmipson procumbens var. *procumbens*	Silky California broom	Native	Fabaceae	–
Acmispon americanus var. *americanus*	Spanish lotus	Native	Fabaceae	–
Acmispon brachycarpus	Short podded lotus	Native	Fabaceae	–
Aesculus californica	California buckeye	Native	Sapindaceae	–
Allium peninsulare	Mexicali onion	Native	Alliaceae	–
Alnus rhombifolia	White alder	Native	Betulaceae	–
Amsinckia intermedia	Common fiddleneck	Native	Boraginaceae	–
Anemopsis californica	Yerba mansa	Native	Saururaceae	–
Aphyllon corymbosum	Flat topped broom rape	Native	Orobanchaceae	–
Artemisia douglasiana	California mugwort	Native	Asteraceae	–
Asclepias californica	California milkweed	Native	Apocynaceae	–

Scientific Name	Common Name	Native/ Non-Native	Family	Status
Asclepias fascicularis	narrow leaf milkweed	Native	Apocynaceae	–
Avena barbata	Slim oat	Non-native	Poaceae	Cal-IPC rating: Moderate
Baccharis salicifolia	Mule fat	Native	Asteraceae	–
Balsamorhiza deltoidei	Deltoid balsam root	Native	Asteraceae	–
Boechera arcutata	Arching rockcress	Native	Brassicaceae	–
Bowlesia incana	Bowelesia	Native	Apiaceae	–
Brassica nigra	Black mustard	Non-native	Brassicaceae	Cal-IPC rating: High
Brickellia californica	California brickellia	Native	Asteraceae	–
Brodiaea elegans	Harvest brodiaea	Native	Themidaceae	–
Bromus diandrus	Ripgut brome	Non-native	Poaceae	Cal-IPC rating: Moderate
Calandrinia menziesi	Red maids	Native	Montiaceae	–
Calandrinia menziesii	Calandrinia	Native	Montiaceae	–
Calochortus venustus	Butterfly mariposa lily	Native	Liliaceae	–
Calystegia longipes	Piute morning glory	Native	Convolvulaceae	–
Camissonia contorta	Contorted sun cup	Native	Onagraceae	–
Capsella bursa-pastoris	Shepards purse	Native	Brassicaceae	–
Castilleja attenuata	Narrow-leaved owl's clover	Native	Fabaceae	–
Castilleja exerta	Owl's clover	Native	Fabaceae	–
Castilleja subinclusa ssp. *subinclua*	Long leaf paintbrush	Native	Fabaceae	–
Caulathus coulteri var. *coulteri*	Coulter’s jewel flower	Native	Brassicaceae	–
Celtis reticulata	Western hackberry	Native	Cannabaceae	–
Chaenactis glabriuscula var. *glabriuscula*	Common yellow chaenactis	Native	Asteraceae	–
Chenopodium californicum	California goosefoot	Native	Chenopodiaceae	–

Scientific Name	Common Name	Native/ Non-Native	Family	Status
Clarkia ungulata	Woodland clarkia	Native	Orobanchaceae	–
Claytonia parviflora	Narrow-leaved miner's lettuce	Native	Montiaceae	–
Claytonia perfoliate	Miner's lettuce	Native	Montiaceae	–
Collinsia concolor	Chinese houses	Native	Plantaginaceae	–
Collinsia heterophylla	Purple Chinese houses	Native	Plantaginaceae	–
Collinsia tinctora	Tincture plant	Native	Plantaginaceae	–
Croton setiger	Turkey-mullein	Native	Euphorbiaceae	–
Cryptantha flaccida	Beaked cryptantha	Native	Boraginaceae	–
Cryptantha muricata var*. muricata*	Showy prickly nut cryptantha	Native	Boraginaceae	–
Cucurbita palmata	Coyote melon	Native	Cucurbitaceae	–
Cylindropuntia echinocarpa	Silver cholla	Native	Cactaceae	–
Cyperus esculentus	Nut sedge	Native	Cyperaceae	–
Datura wrightii	Sacred datura	Native	Solanaceae	–
Delphinium graciletum	Meadow larkspur	Native	Ranunculaceae	–
Delphinium gypsonphilum	Gypsum loving larkspur	Native	Ranunculaceae	–
Diplacus grandiflorus	Sticky monkeyflower	Native	Phrymaceae	–
Dipterostemon capitatus	Blue dicks	Native	Themidaceae	–
Dudleya cymosa	Rock lettuce	Native	Crassulaceae	–
Encelia actoni	Acton brittlebush	Native	Asteraceae	–
Epilobium ciliatum ssp*. ciliatum*	Willow herb	Native	Onagraceae	–
Epilobium canum ssp*. canum*	California fuchsia	Native	Onagraceae	–
Eriogonum roseum	Wand buckwheat	Native	Polygonaceae	–
Eriophyllum lanatum	Wooly sunflower	Native	Asteraceae	–
Erysimum capitatum var. *capitatum*	Sand dune wallflower	Native	Onagraceae	–

Scientific Name	Common Name	Native/ Non-Native	Family	Status
Erythranthe guttata	Seep spring monkeyflower	Native	Phrymaceae	–
Erythranthe cardinalis	Cardinal monkey flower	Native	Phrymaceae	–
Erythranthe moschata	Musk monkeyflower	Native	Phrymaceae	–
Eschscholzia caespitosa	Tufted poppy	Native	Papaveraceae	–
Eschscholzia californica	California poppy	Native	Papaveraceae	–
Eschscholzia lobbii	Frying pan poppy	Native	Papaveraceae	–
Eucalyptus camaldulensis	Red gum	Non-native	Myrtaceae	Cal-IPC rating: Limited
Euthamia occidentalis	Western goldenrod	Native	Asteraceae	–
Fraxinus latifolia	Oregon ash	Native	Oleaceae	–
Gallium aparine	Common bedstraw	Native	Apiacaea	–
Gilia capitata ssp*. abrotanifolia*	Ball gilia	Native	Polemoniaceae	–
Gilia tricolor ssp*. diffus*	Birds eye gilia	Native	Polemoniaceae	–
Gnaphalium pulstre	Lowland cudweed	Native	Asteraceae	–
Helenium puberulum	Sneezeweed	Native	Asteraceae	–
Heliotropium curassavicum ssp*. oculatum*	Alkali heliotrope	Native	Heliotropiaceae	–
Hesperoyucca whipplei	Chaparral yucca	Native	Asparagaceae	–
Hieracium horridum	Shaggy hawkweed	Native	Asteraceae	–
Juncus balticus	Baltic rush	Native	Juncaceae	–
Juncus bufonius	Common toad rush	Native	Juncaceae	–
Lactuca serriola	Pricky lettuce	Non-native	Asteraceae	–
Lasthenia debilis	Greene's goldfields	Native	Asteraceae	–
Leptosiphon bicolor	True babystars	Native	Polemoniaceae	–
Leptosiphon ciliates	Whiskerbrush	Native	Polemoniaceae	–

Scientific Name	Common Name	Native/ Non-Native	Family	Status
Leptosiphon monatus	Mustang clover	Native	Polemoniaceae	–
Lithophragma affine	Common woodland star	Native	Saxifragaceae	–
Lithophragma heterophyllum	Woodland star	Native	Saxifragaceae	–
Lupinus albifrons var. *albifrons*	Silver bush lupine	Native	Fabaceae	–
Lupinus microcarpus	Chick lupine	Native	Fabaceae	–
Marah horrida	Sierra man-root	Native	Cucurbitaceae	–
Matricaria discoidea	Pineappleweed	Native	Asteraceae	–
Melilotus albus	White sweetclover	Non-native	Fabaceae	–
Melilotus indicus	Annual yellow sweetclover	Non-native	Fabaceae	–
Micranthes californica	California saxifrage	Native	Saxifragaceae	–
Mirabilis laevis var. *cedrosensis*	California four O' Clock	Native	Nyctaginaceae	–
Monardella odoratissima	Mountain monardella	Native	Lamiaceae	–
Nastrium officinale	Watercress	Native	Brassicaceae	–
Nemophila pulchilla var. *fremontii*	Fremont's nemophila	Native	Boraginaceae	–
Nicotiana glauca	Indian tobacco	Non-native	Solanaceae	Cal-IPC rating: Moderate
Oenothera californica	California primrose	Native	Onagraceae	–
Oenthera californicum	California evening primrose	Native	Onagraceae	–
Oenothera deltoides ssp. *cognata*	Desert lantern	Native	Onagraceae	–
Opuntia basilaris	Beavertail cactus	Native	Cactaceae	–
Orobanche uniflora	Single-leaved broomrape	Native	Orobanchaceae	–
Oxalis corniculata	Yellow sorrel	Non-native	Oxalidaceae	–
Papaver heterophyllum	Wind poppy	Native	Papaveraceae	–
Pellaea andromedifolia	Coffee fern	Native	Pteridaceae	–
Pellaea mucronata var. *californica*	Bird's foot fern	Native	Pteridaceae	–

Scientific Name	Common Name	Native/ Non-Native	Family	Status
Penstemon grinnelli var. *scrophulinoides*	Grinnell's beardtongue	Native	Plantaginaceae	–
Phacelia cicutaria var. *cicutaria*	Caterpillar phacelia	Native	Boraginaceae	–
Phacelia distens	Common phacelia	Native	Boraginaceae	–
Phacelia egena	Rock phacelia	Native	Boraginaceae	–
Pholistoma auritum var. *auritum*	Blue fiesta flower	Native	Hydrophyllaceae	–
Pinus sabiniana	Grey pine	Native	Pinaceae	–
Pinus sabiniana	Gray pine	Native	Pinaceae	–
Plagiobothrys tenellus	Slender popcorn flower	Native	Boraginaceae	–
Plantago lanceolata	English plantain	Non-native	Plantaginaceae	Cal-IPC rating: Limited
Plantago major	Common plantain	Non-native	Plantaginaceae	–
Platanus racemosa	California sycamore	Native	Platanaceae	–
Populus fremontii ssp. *fremontii*	Fremont cottonwood	Native	Salicaceae	–
Pseudognaphalium californicum	California cudweed	Native	Asteraceae	–
Punica granatum	Pomegranate	Non-native	Lythraceae	–
Quercas douglasii	Blue oak	Native	Fagaceae	–
Quercus agrifolia	Live oak	Native	Fagaceae	–
Quercus wislizeni	Interior live oak	Native	Fagaceae	–
Rafinesquia californica	California chicory	Native	Asteraceae	–
Ribes californicum	California gooseberry	Native	Grossulariaceae	–
Ribes roezlii	Sierra gooseberry	Native	Grossulariaceae	–
Ricinus communis	Castor	Non-native	Euphorbiaceae	Cal-IPC rating: Limited
Rorippa curvisiliqua	Curvepod yellowcress	Native	Brassicaceae	–
Rubus californica	California blackberry	Native	Rosaceae	–

Scientific Name	Common Name	Native/ Non-Native	Family	Status
Rumex conglomeratus	Green dock	Non-native	Polygonaceae	–
Salix exigua	Sandbar willow	Native	Salicaeae	–
Salvia columbariae	Chia	Native	Lamiaceae	–
Schoenoplectus californicus	Bullrush	Native	Cyperaceae	–
Scrophularia californica	California bee plant	Native	Scrophulariaceae	–
Solanum xanti	Purple nightshade	Native	Solanaceae	–
Sonchus asper	Spiny sow thistle	Non-native	Asteraceae	–
Stellaria media	Chickweed	Non-native	Caryophyllaceae	–
Stephanomeria pauciflora	Wire lettuce	Native	Asteraceae	–
Thalictrum fendleri	Meadow rue	Native	Ranunculaceae	–
Thyanocarpus curvipes	Lace pods	Native	Brassicaceae	–
Torilis arvensis	Hedge parsley	Non-native	Apiaceae	Cal-IPC rating: Moderate
Toxicodendron diversilobum	Poison oak	Native	Anacardiaceae	–
Trichostema lanceolatum	Vinegarweed	Native	Lamiaceae	–
Trifolium albopurpureum	Indian clover	Native	Fabaceae	–
Trifolium graciletum	Pin point clover	Native	Fabaceae	–
Trifolium oliganthum	Tomcat clover	Native	Fabaceae	–
Triteleia ixioides ssp. *scabra*	Foothill triteleia	Native	Themidaceae	–
Triteleia laxa	Ithuriel spears	Native	Themidaceae	–
Uropappus lindleyi	Silver puffs	Native	Asteraceae	–
Urtica dioica	Stinging nettle	Native	Urticaceae	–

Scientific Name	Common Name	Native/ Non-Native	Family	Status
Verbascum blattaria	Moth mullein	Non-native	Scrophulariaceae	–
Veronica anagallis-aquatica	Water speedwell	Non-native	Plantaginaceae	–
Xanthium strumarium	Cocklebur	Native	Asteraceae	–

APPENDIX J

Non-Native Invasive Plants Potentially Occurring in the Study Area

Table J-1. Non-Native Invasive Plants Potentially Occurring in the Study Area

Scientific Name	Common Name(s)	Cal-IPC Rating[1]	Species Code
Aegilops triuncialis	barb goatgrass	High	AETR
Arundo donax	giant reed	High	ARDO4
Brassica tournefortii	Sahara mustard	High	BRTO
Bromus madritensis ssp. rubens	red brome	High	BRMA
Bromus tectorum	cheatgrass	High	BRTE
Carduus pycnocephalus	Italian thistle	Moderate	CAPY2
Carthamus lanatus	woolly distaff thistle	High	CALA20
Centaurea solstitialis	yellow starthistle	High	CESO3
Centaurea stoebe ssp. micranthos	spotted knapweed	High	CESTM
Cirsium vulgare	bull thistle	Moderate	CIVU
Cortaderia jubata	jubatagrass	High	COJU2
Cortaderia selloana	pampasgrass	High	COSE4
Cytisus scoparius	Scotch broom	High	CYSC4
Delairea odorata	Cape-ivy	High	DEOD
Digitalis purpurea	foxglove	Limited	DIPU
Ehrharta calycina	purple veldtgrass	High	EHCA
Elymus caput-medusae	medusahead	High	ELCA13
Euphorbia virgata	Leafy spurge	Moderate	EUVI7
Genista monspessulana	French broom	High	GEMO2
Hedera helix	English ivy	High	HEHE
Lathyrus latifolius	Perennial pea	Watch	LALA4
Lepidium latifolium	perennial pepperweed	High	LELA2
Lythrum salicaria	purple loosestrife	High	LYSA2
Olea europaea	olive	Limited	OLEU
Oncosiphon pilulifer	stinknet	High	ONPI
Onopordum acanthium	Scotch thistle	High	ONAC
Poa pratensis	Kentucky bluegrass	Limited	POPR
Polypogon monspeliensis	rabbitsfoot grass	Limited	POMO5
Rubus armeniacus	Himalayan blackberry	High	RUAR9
Sesbania punicea	Rattlebox	High	SEPU7
Silybum marianum	milk thistle	Limited	SIMA3
Spartium junceum	Spanish broom	High	SPJU2
Tamarix chinensis	Chinese tamarisk	High	TACH2

Scientific Name	Common Name(s)	Cal-IPC Rating[1]	Species Code
Tamarix gallica	French tamarisk	High	TAGA
Tamarix parviflora	smallflower tamarisk	High	TAPA4
Tamarix ramosissima	saltcedar	High	TARA
Ulex europaeus	Gorse	High	ULEU
Verbascum thapsus	woolly mullein	Limited	VETH

NOTES:

[1] The Cal-IPC Invasive Plant Inventory categorizes plants as High, Moderate, or Limited, according to the degree of ecological impact in California (Cal-IPC 2022).

- **High** – Severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.
- **Moderate** – Substantial and apparent—but generally not severe—ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.
- **Limited** – Invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.
- **Watch** – These species have been assessed as posing a high risk of becoming invasive in the future in California.

[2] The Cal-IPC Invasive Plant Inventory creates a query based on generalized habitat types. There is no crosswalk available between Cal-IPC habitat types and CALVEG alliances. Therefore, the habitat types that most closely matched CALVEG vegetation alliances in the Project vicinity were selected. These included the following: 1) grassland, vernal pools, meadows, and other herb communities; 2) riparian and bottomland habitat; 3) woodland habitat, and 4) scrub and chaparral.

APPENDIX K

Representative Photographs of Non-Native Invasive Plant Populations in the Study Area

Photo K-1. Cheatgrass (*Bromus tectorum*) along the side of Stark Creek Road.

Photo K-2. Scotch thistle (*Onopordum acanthium*) along the Cow Flat Creek Trail

Photo K-3. Scotch thistle (*Onopordum acanthium*) near Flume No. 1

Photo K-4. Rabbitsfoot grass (*Polypogon monspeliensis*) along the riverbank near the Kern River No. 1 Powerhouse and Switchyard.

Photo K-5. Rabbitsfoot grass (*Polypogon monspeliensis*) near the Democrat Dam Impoundment.

Photo K-6. Common mullein (*Verbascum thapsus*) near Democrat Dam Impoundment.

Photo K-7. Common mullein (*Verbascum thapsus*) near Flume No. 1