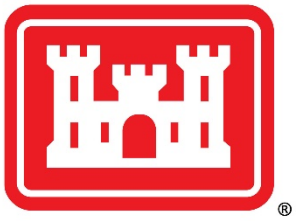
APPENDICES

APPENDIX A - BIOLOGICAL ASSESSMENT

Tule River Spillway Enlargement Project
Supplemental Biological Assessment
for the
Road Relocation and Right Abutment Spillway Cut
Tulare County, CA



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1.0 INTRODUCTION

The U.S. Army Corps of Engineers, Sacramento District (Corps), is requesting reinitiation of consultation with the U.S. Fish and Wildlife Service (USFWS) under Section 7 of the Federal Endangered Species Act (ESA) to evaluate, on a biological assessment (BA) level, potential effects associated with design changes to the proposed Tule River Spillway Enlargement Project. A Biological Opinion (BO) for this project was issued December 1999, entitled "Formal Section 7 Consultation on the Proposed Permanent 10-foot Dam Elevation Increase at Lake Success in Tulare County, California" (1-1-99-F-0085; USFWS 1999a). This BA is prepared in accordance with the legal requirements set forth under regulations implementing Section 7 of the Endangered Species Act (ESA) (50 CFR 402; 16 U.S.C. 1536 (c)).

Re-initiation is being pursued for two reasons: (1) There are modifications to the proposed action since the original consultation in 1999. The road relocation and spillway widening to accommodate the ogee weir design were not covered in detail in the Tule River Basin Investigation Final Environmental Impact Statement/Report (FEIS/FEIR) (Corps 1999) and accompanying Biological Data Report due to insufficient information on the future location of the road and hydraulics of the spillway. (2) There are changes regarding listed species referenced in the BO (USFWS 1999a). The USFWS removed the Valley Elderberry Longhorn Beetle (VELB) (*Desmocerus californicus dimorphus*) from protected status in Tulare County since the species range ends more than 85 miles to the north (USFWS 2019). The USFWS delisted the Bald Eagle (*Haliaeetus leucocephalus*) on August 8, 2007. The Giant Garter Snake (*Thamnophis gigas*) is no longer found downstream from Lake Success along the Tule River, or anywhere else in Tulare County (USFWS 2017). Thus, these three species will not be evaluated in this document. Least Bell's vireo (*Vireo bellii pusillus*) was not covered in the 1999 BO since the species was not known to occur at Lake Success. Corps bird surveys conducted in 2014 verified that the species now does occur at the lake (Stewart 2014). Southwestern willow flycatcher (*Empidonax traillii extimus*) was also not included in the 1999 BO. It is included in this BA due to the existence of potential habitat at Lake Success.

1.1 Threatened, Endangered, Proposed Threatened or Proposed Endangered Species

The Corps received a species list for the project area from the USFWS's Information for Planning and Consultation (IPaC) online system on February 8, 2019 (Consultation Code 08ESMF00-2019-SLI-0972). The Corps requested and received an updated list on May 22, 2019, and October 31, 2019 (Appendix A). The latest updated list did not contain any changes. Species determined to have "No Effect" from the proposed action are detailed in Table 1 (attached at the end of this biological assessment).

The following Threatened, Endangered, Proposed Threatened or Proposed Endangered Species may be affected[1] by the proposed action:

San Joaquin Kit Fox (*Vulpes macrotis mutica*) **E**
Least Bell's Vireo (*Vireo bellii pusillus*) **E**

1 This document will discuss making the "may affect" and subsequent determinations in later sections.

Southwestern Willow Flycatcher (*Empidonax traillii extimus*) **E**
San Joaquin Adobe Sunburst (*Pseudobahia peirsonii*) **T**

E = Endangered, **T** = Threatened, **CH** = Critical Habitat.

There are no candidate species or other sensitive species within the proposed action area. The California condor (*Gymnogyps californianus*) is the only species with designated critical habitat in the Lake Success area. The critical habitat includes roughly the northern one-fifth of the lake. However, there is no appropriate breeding habitat for the condor within the project area and there would be no direct effects from the project on the critical habitat. As a result, the Corps has determined the proposed project would have no effect on the condor.

2.0 CONSULTATION TO DATE

December 17, 1999. USFWS Biological Opinion received, "Formal Section 7 Consultation on the Proposed Permanent 10-foot Dam Elevation Increase at Lake Success in Tulare County, California" (1-1-99-F-0085).

December 2018. Consultation re-initiated informally with Harry Kahler, USFWS Wildlife Biologist.

April 2-4, 2019. Site visit and biological reconnaissance surveys of the road relocation and increased pool surface area were conducted. Surveys conducted by a botanist (L. Guerrero, Corps), mammalogist and entomologist (E. Tomasovic, Corps), and an ornithologist (H. Kahler, USFWS) focused on environmental awareness and species distribution. Two new and previously undocumented locations of the San Joaquin adobe sunburst (*Pseudobahia peirsonii*) were discovered and are being entered into the California Natural Diversity Database (CNDDB).

July 15, 2019. Corps submitted Road Relocation and Right Abutment Cut BA to USFWS.

July 31, 2019. USFWS asked the Corps to adhere to the original determinations from the 1999 BO. The Corps responded on August 6, 2019, agreeing to adhere to the original BO determinations.

September 5, 2019. USFWS emailed Corps asking for a meeting.

September 12, 2019. USFWS and Corps met to discuss ESA consultation and coordination under the Fish and Wildlife Coordination Act (FWCA; 16 U.S.C. §661, et seq.) for the Tule River Spillway Enlargement Project. USFWS and Corps agreed that a revised BA would be submitted that updates the effects evaluation presented in the 1999 BO, superseding the July 15, 2019 BA.

3.0 DESCRIPTION OF THE PROPOSED ACTION

3.1 Background

Lake Success Dam is located on the main branch of the Tule River about 6 miles east of Porterville, California, in Tulare County. It is in the foothills of the Sierra Nevada moutains, fifty miles north of Bakersfield and sixty miles southeast of Fresno.

The Tule River Spillway Raise project consists of constructing a 10 foot-high concrete ogee weir across the spillway and raising the gross pool elevation (maximum lake level) from 652.5 feet to 662.5 feet (Figure 1; all elevations are NGVD29).

The project will be done in two construction phases:

Phase 1: Right Abutment Spillway Cut, Road Relocation, and Temporary Stockpiles
Construction Start: July 2020
Construction Completion: March 2021

Phase 2: Spillway Raise, Left Abutment Cut (if needed), Recreation Facilities, Highway 190 & Frazier Dike Armoring, and Utility Relocations.
Construction Start: October 2021
Construction Completion: May 2023

3.2 Authority

Authorization for construction of the Tule River Spillway Enlargement Project at Lake Success is provided by the Water Resources Development Act (WRDA) of 1999, Section 101 (b)(4) (Public Law 106-53, 17 August 1999), which authorized this flood damage reduction and water supply project based on the recommendations of the final report of the Chief of Engineers.

3.3 Proposed Action

The proposed action would decrease flood flows in the downstream distributaries mainly during the spring snowmelt season (Figure 2), thereby decreasing the flooding of adjacent agricultural lands and urban areas, and decreasing the impact of high water events on downstream levees and infrastructure. Currently, flooding downstream of Success Dam can cause extensive damage to residences, agricultural farmland, and public facilities. Under the current operations of the dam, water releases greater than 3,200 cubic feet per second (cfs) from Success Dam can cause damage to downstream agricultural areas (Corps 2011). The downstream channel capacity ranges from 10,000 cfs through the city of Porterville to as little as 1,000 cfs west of the city. Agricultural areas west of the city are the first areas where property damage and danger to residents have historically occurred, given a release greater than 3,200 cfs (Corps 2011).

Components of the proposed action consist of (Figure 3):

- Widening the spillway sill at Success Dam from 200 feet to 365 feet.

- Relocating the existing road through the spillway, Worth Drive/Avenue 146, to the new road bench constructed as part of the spillway widening.
- Restoring the lower third of the spillway to its original design grade using excavated material from the spillway widening.
- Constructing a 10-foot high concrete ogee weir over the existing spillway sill.
- Flood-proofing restrooms at the Tule and Rocky Hill recreation areas.
- Extending and widening the Tule recreation area boat ramp.
- Enlarging the existing parking area at Rocky Hill recreation area to replace parking areas lost to higher gross pool levels.
- Protecting in place the Tule recreation area well and storage tank by an earthen berm.
- Relocating the Rocky Hill recreation area storage tank, well, and metal shed to higher ground.
- Placing rock revetment along the State Highway 190 bridge abutments for erosion protection.
- Placing rock revetment (3,500 linear feet) along Frazier Dike for erosion protection.
- Raising fourteen transmission towers and 11,800 feet of power lines to meet minimum clearance criteria.
- Updating the Success Lake and Dam water control manual to reflect the change in flood storage capacity for the lake.

For Phase 1, the Corps, in partnership with its nonfederal sponsor, the Lower Tule River Irrigation District (LTRID), would widen the current spillway at Lake Success from 200 to 365 feet by removing a portion of the right bank abutment and incorporating a road bench within the new slope (Figures 4-9). The existing road through the spillway, Worth Drive/Avenue 146, would be relocated to the new road bench. Road relocation is required since the new ogee weir, constructed in Phase 2, would obstruct the road in its current location.

Worth Drive/Avenue 146 enables public access to the Rocky Hill recreation area and two private residences when the reservoir is not at full capacity. This road is currently located adjacent to the right abutment slope of the spillway. The Corps is proposing to relocate the road along the right abutment cut above the new proposed gross pool, removing the road from the spillway, to avoid most future road closures due to spillway engagement during high water (Figures 5, 8, and 9). The new road would become a public-use, Corps-maintained road and would remain open up to at least the 100-year flood event. In the past 58 years since Lake Success was built, lake levels have been high enough to close the road seven times (Figure 10).

Construction sequencing of the right abutment cut and road realignment would begin with the contractor staging equipment and conducting preliminary site preparation, including installation of construction trailers, power lines or generators, security fencing, and movement of equipment. After mobilization, vegetation and soil would be grubbed and stripped from the right abutment cut/new roadway area and relocated to the staging/stockpile areas (Figure 7).

Next, drilling and explosives would be used to shape the spillway abutment and road bench. Excess blast rock would be used to repair the lower emergency spillway gradient and temporarily stockpiled for use in Phase 2 to armor Frazier Dike and the Highway 190 bridge footing and abutment. Detailed design plans for Phase 1 are included in Appendix B. The lower emergency spillway was damaged in December 1966 during a flood event (Figure 11). Blasted rock material from the right abutment cut would be used to restore the spillway to its original, pre-1966, grade and elevation (for design details see Appendix B, sheet GC-103).

Carefully designed, controlled blasts would be used to break, lift, and push broken rock anywhere from 10 to 30 feet during the right abutment cut and road bench construction. Flyrock may occur when a shot is under burdened, *i.e.* when there is only a small amount of rock in front of the blasthole. In such a case, flyrock may travel 75 to 150 feet. The contractor would be stopped from blasting if flyrock travels more than 250 feet from a bench until the reasons for flyrock have been determined and the blasting practice modified. The 750 and 2,500-ft buffers shown in figures 8 and 9 are for safety purposes only and do not represent flyrock travel distances (C. Breeds, President of Blasting, Sub Terra, Inc, e-mail message, November 6, 2019). After each blast, excavators and dump trucks would move debris to temporary stockpiles.

The spillway raise, Highway 190 bridge abutment and Frazier Dike armoring, flood-proofing of recreation facilities, and utility relocations would occur as part of Phase 2 construction (Figure 3). Implementation of these features is the same as was described in the 1999 project documentation. The Lake Success Water Control Manual would also be updated to reflect the changes in the dam's flood storage capabilities resulting from the spillway raise.

3.4 Action Area

The action area is defined as the footprint of the proposed project components, temporary work areas during construction, and the properties around Lake Success within the new proposed gross pool. In addition, the action area includes those areas of the Tule River 100-year floodplain downstream of Success Dam that would be affected by the change in frequency of flooding caused by the spillway raise (Figures 1-3).

The temporary work area for Phase 1 would cover approximately 130 acres of Corps property (Figure 4). The actual construction footprint (area of disturbed ground) would cover approximately 14 acres (Figures 7 and 9).

For Phase 2, construction of the ogee weir would occur within the newly enlarged spillway. Flood-proofing, protection, and relocation of existing infrastructure would occur within the recreation areas. Blasted rock from Phase 1, would be used to armor Frazier Dike and the abutments of the State Highway 190 bridge (Figure 3). Raising fourteen transmission towers and 11,800 feet of power lines to meet minimum clearance criteria would temporarily occur in the existing powerline right of way.

Currently, Success Dam controls downstream flows by making releases through its outlet works. When the reservoir elevation exceeds the emergency spillway crest elevation, uncontrolled flows

are released via the spillway into the Tule River. The current emergency spillway crest elevation (652.5 feet) corresponds to a flood event with a 2.2 percent annual chance of exceedance (ACE) (approximately, the "46-year flood"). See figures 12-14. The new ogee weir, installed during Phase 2 of this project, is designed to reduce flooding immediately below the dam in the Porterville area to a less than one percent annual chance of exceedance flood ("100-year flood").

3.5 Avoidance and Minimization Measures

The following measures will be implemented by the Corps, its local partners, and/or the construction contractor to avoid or minimize project effects on the San Joaquin kit fox, least Bell's vireo, southwestern willow flycatcher, and the San Joaquin Adobe sunburst.

- Prior to construction, an employee education program will be conducted consisting of a brief presentation of San Joaquin kit fox, Southwestern willow flycatcher, least Bell's vireo, San Joaquin adobe sunburst, California condor, Bald and Golden eagles, and migratory birds by persons knowledgeable in biology and legislative protection. The program will include the occurrence of species in the area, its description and life history, and an explanation of the species status and protection under the ESA.
- A representative will be appointed who would be the contact for any employee/contractor who might find dead, injured, or entrapped threatened and endangered animals or new plots of threatened and endangered plants in the work area. This representative will contact the USFWS immediately.
- A Corps botanist will conduct pre-construction surveys within the construction footprint during peak-flower, based on bloom times of known populations in the area, to ensure that no San Joaquin adobe sunburst are present. If the species is present, the Corps will undertake the following mitigation measures: (a) as possible, avoid plants and erect a 25-foot buffer using exclusionary fencing; (b) if avoidance is not practical, plants will be hand dug and transplanted outside the construction footprint under the guidance of a qualified botanist or restoration ecologist; (c) transplanted plant locations will first be chosen with a preference for having existing San Joaquin adobe sunburst plants, second, former known adobe sunburst location, and third, an area with similar slope, aspect and soils; (d) in addition to transplanting, topsoil will be collected in a 6-foot buffer around the plants to help secure the seedbank; (e) collected topsoil will be placed in six to twelve-inch wide, circular, shallow pits near the transplanted plants; (f) during Phase 1 & 2 construction, transplanted plants will be monitored by a qualified biologist during each growing season via flower counts, percent cover, and stem length measurements; and (g) an annual monitoring report will be submitted to USFWS each November until one year after construction is complete. Any existing San Joaquin adobe sunburst plants located near the construction footprint will be protected with exclusionary fencing for the duration of the project.
- A certified kit fox biologist, considered qualified by the USFWS, will conduct pre-activity surveys for kit fox presence within 30 days, and to the extent practicable, within 14 days of construction initiation using methodologies acceptable to the USFWS. Surveys will cover all areas potentially affected by ground disturbing activities associated with the project, including vehicle travel and staging.

- Project-related vehicles will observe a daytime speed limit of 15-mph and a nighttime speed limit of 10-mph throughout the site in all project areas, except on county roads and State and Federal highways. This is particularly important at night when kit foxes are most active. Night-time construction will be minimized to the extent possible. Off-road traffic, outside of designated project areas, will be prohibited.
- Stormwater runoff will be controlled using standard construction BMPs and equipment (straw wattles, silt fencing, etc.).
- All food-related trash items such as wrappers, cans, bottles, and food scraps will be disposed of in securely closed containers, and removed at least once a week from a construction or project site. Daily removal is preferred.
- No firearms will be allowed on the project site.
- No pets, such as dogs or cats, will be permitted on the project site to prevent harassment, mortality, or destruction of dens or burrows.
- To prevent inadvertent entrapment of kit foxes, or other animals, during the construction phase of a project, all excavated, steep-walled holes or trenches more than 2-feet deep will be covered at the close of each working day by plywood or similar materials. If the trenches cannot be closed, one or more escape ramps constructed of earthen-fill or wooden planks would be installed. Before such holes or trenches are filled, they will be thoroughly inspected for trapped animals. If at any time a trapped or injured animal is discovered, the USFWS would be contacted.
- In the case of trapped animals, escape ramps or structures would be installed immediately to allow the animal(s) to escape, or the USFWS would be contacted for guidance.
- Kit foxes are attracted to den-like structures, such as pipes, and may enter stored pipes and become trapped or injured. All construction pipes, culverts, or similar structures with a diameter of 4-inches or greater that are stored at a construction site for one or more overnight periods will be thoroughly inspected for kit foxes before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a kit fox is discovered inside a pipe, that section of pipe would not be moved until the USFWS has been consulted. If necessary, and under the direct supervision of the biologist, the pipe may be moved only once to remove it from the path of construction activity, until the fox has escaped.
- Use of rodenticides and herbicides in project areas will be restricted. This is necessary to prevent primary or secondary poisoning of kit foxes and California condor, and the depletion of prey populations on which they depend. All uses of such compounds would observe label and other restrictions mandated by the U.S. Environmental Protection Agency, California Department of Food and Agriculture, and other State and Federal legislation, as well as additional project-related restrictions deemed necessary by the USFWS. If rodent control must be conducted, zinc phosphide should be used because of a proven lower risk to kit fox.

4.0 STATUS OF THE SPECIES AND CRITICAL HABITAT IN THE ACTION AREA

For species that are described and covered in this consultation, habitat preferences and distributions are based on published data, agency documents, and review of the IPaC from the USFWS (Consultation Code: 08ESMF00-2019-SLI-0972), personal conversation with USFWS Biologist Harry Kahler, and an environmental survey conducted from 2-4 April 2019.

4.1 San Joaquin Kit Fox

Status. The San Joaquin kit fox (*Vulpes macrotis mutica*) was listed as an endangered species on March 11, 1967 (USFWS 1967; 32 FR 4001), and by the state of California as a threatened species on June 27, 1971. A Recovery Plan was approved in 1983 (USFWS 1983), and an updated Recovery Plan that covered 34 upland species in the San Joaquin Valley was approved in 1998 (USFWS 1998b). The 1998 Recovery Plan identified the San Joaquin kit fox as an umbrella species. Recovery actions for the San Joaquin kit fox are critical to the recovery of many other listed species because the kit fox occurs in the same natural communities and requires relatively large areas of natural habitat, thus providing an umbrella of protection for other species that require smaller habitat blocks (USFWS 1998b). Critical habitat has not been designated for this species.

Distribution. Range for the San Joaquin kit fox includes the San Joaquin Valley, encompassing portions of the valley floor and adjacent foothills and interior Coast Range valleys, historically from as far north as Tracy (San Joaquin County) and La Grange (Stanislaus County) and south to Kern County (Grinnell et al. 1937; USFWS 2010). By 1930, the range was believed to have decreased to only the southern and western parts of the San Joaquin Valley and adjacent foothills and interior Coast Range Valleys, but subsequent research found these foxes in many additional areas, northward to Contra Costa County, including areas where the species previously had not been detected (USFWS 2010). However, some recently documented locations likely reflect dispersing individuals rather than resident populations, and many populations are small, isolated, and/or declining or apparently extirpated (USFWS 2010).

Historically, this species occurred in several San Joaquin Valley native plant communities. In the southernmost portion of the range, these communities included valley sink scrub, valley saltbush scrub, Upper Sonoran subshrub scrub, and annual grassland (USFWS 1998b). San Joaquin kit foxes also exhibit a capacity to utilize habitats that have been altered by people. They are present in many oil fields, grazed pasturelands, and "wind farms" (Cypher 2000). They also utilizes oak savanna and some types of agriculture (e.g. orchards and alfalfa), although the long-term suitability of these habitats is unknown (Jensen 1972; USFWS 1998b). Kit foxes can inhabit the margins and fallow lands near irrigated row crops, orchards, and vineyards, and may forage occasionally in these agricultural areas (USFWS 1998b; Cypher et al. 2014). The San Joaquin kit fox seems to prefer more gentle terrain and decreases in abundance as terrain ruggedness increases (Grinnell et al. 1937; Morrell 1972; Warrick and Cypher 1998).

Locally, the San Joaquin kit fox was more prevalent in the 1970s. Based on CNDDB, eleven occurrences are within ten miles of the project area, all to the west. None have been documented in the Lake Success quadrangle, which encompasses the project area. Only two occurrences have

been documented since the 1970s; ten miles and eight miles away from the proposed action in 1992 and 1989, respectively (CDFW 2019). The closest documented occurrence is six miles from the proposed action (CDFW 2019). Downstream, there are fourteen kit fox occurrences within or adjacent to the current Tule River and Tulare Lakebed 100-year floodplain, all from the early to mid-1970s.

Life History. In September and October, adult females begin to excavate and enlarge natal dens (Morrell 1972), and adult males join the females in October or November. Typically, pups are born between February and late March following a gestation period of 49 to 55 days (Egoscue 1962; Spiegel and Tom 1996; USFWS 1998b). Mean litter sizes are between 2 and 4 pups. Reproductive rates, the proportion of females bearing young, of adult San Joaquin kit foxes vary annually with environmental conditions, particularly food availability. Although most young kit foxes disperse less than 5 miles (Scrivner et al. 1987), dispersal distances of up to 76.3 miles have been documented for the San Joaquin kit fox (USFWS 1998b). Dispersal can be through disturbed habitats, including agricultural fields, and across highways and aqueducts. Some kit foxes delay dispersal and may inherit their natal home range.

Kit foxes have been reputed to be poor diggers, and their dens are usually located in areas with loose-textured, friable soils (O'Farrell 1984). However, the depth and complexity of their dens suggest-that they possess good digging abilities, and kit fox dens have been observed on a variety of soil types (Reese et al. 1992; USFWS 1998b). Kit fox dens extend from 4.3 ft to almost 10 ft below the soil surface (Egoscue 1956; Morrell 1972; O'Neal et al. 1987). Some studies have suggested that where hardpan layers predominate, kit foxes create their dens by enlarging the burrows of California ground squirrels (*Spermophilus beecheyi*) or badgers (*Taxidea taxus*) (Jensen 1972; Morrell 1972). In parts of their range, particularly in the foothills, kit foxes often use ground squirrel burrows for dens (Orloff et al. 1986). A more recent study in the Great Basin, found that kit foxes are seeking more hilly and rocky terrain for dens, potentially due to competition and predation by coyotes (Arjo et al. 2003). Kit fox dens are commonly located on flat terrain or on the lower slopes of hills, fewer are found on the crests of hills or ridges (Reese et al. 1992). Common locations for dens include washes, drainages, and roadside berms. Kit foxes also commonly den in human-made structures such as culverts and pipes (Reese et al. 1992; Spiegel et al. 1996).

Den use varies greatly among kit foxes. Dens are used by kit foxes for temperature regulation, shelter from adverse environmental conditions, and escape from predators. Natal and pupping dens may include from two to eighteen entrances and are usually larger than dens that are not used for reproduction (O'Farrell et al. 1980; O'Farrell and McCue 1981). Natal dens may be reused in subsequent years (Egoscue 1962). It has been speculated that natal dens are located in the same location as ancestral breeding sites. Active natal dens are generally 1.2 to 2 miles from the dens of other mated kit fox pairs. Natal and pupping dens usually can be identified by the presence of scat, prey remains, matted vegetation, and mounds of excavated soil outside the dens (O'Farrell 1984). Kit foxes often change dens and may use many dens throughout the year; however, evidence that a den is being used by kit foxes may be absent (Reese et al. 1992). A kit fox can use more than 100 dens throughout its home range, although on average, an animal will use approximately 12 dens a year for shelter and escape cover (Koopman et al. 1998; Cypher et al. 2001). Possible reasons for changing dens include infestation by ectoparasites, local depletion

of prey, or predator avoidance. In the southern San Joaquin Valley, kit foxes were found to use up to 39 dens within a denning range of 320 to 482 acres (Morrell 1972).

The diet of the San Joaquin kit fox varies geographically, seasonally, and annually, based on temporal and spatial variation in abundance of potential prey. Known prey species of the kit fox include white footed mice (*Peromyscus* spp.), insects, California ground squirrels, kangaroo rats (*Dipodomys* spp.), San Joaquin antelope squirrels, black-tailed hares (*Lepus calijornicus*), and chukar (*Alectoris chukar*) (Jensen 1972; Archon 1992; Cypher et al. 2014). Kit foxes also prey on desert cottontails (*Sylvilagus audubonii*), ground-nesting birds, and pocket mice (*Perognathus* spp.) (Cypher et al. 2014). Resource competition between coyotes and foxes may be quite high especially when prey resources are scarce. Competition is common in semi-arid, central California, especially during drought years and results in kit fox mortalities. San Joaquin kit foxes are primarily nocturnal, although individuals are occasionally observed resting or playing (mostly pups) near their dens during the day.

Kit foxes occupy home ranges that vary in size from 1.7 to 4.5 square miles (White and Ralls 1993). Average distances traveled each night range from 5.8 to 9.1 miles and are greatest during the breeding season (Cypher 2000).

Less than 20 percent of the habitat within the historical range of the kit fox remained when the subspecies was listed as federally-endangered in 1967, and there has been a substantial net loss of habitat since that time. The primary factor contributing to this restricted distribution was the conversion of native habitat to irrigated cropland, industrial uses, and urbanization (Laughrin 1970; Jensen 1972; Morrell 1972). Approximately 1.97 million acres of habitat, or about 66,000 acres per year, were converted in the San Joaquin region between 1950 and 1980 (California Department of Forestry and Fire Protection 1988). The counties specifically noted as having the highest wildland conversion rates included Kern, Tulare, Kings, and Fresno, all of which are occupied by kit foxes. Extensive habitat destruction and fragmentation have contributed to smaller, more-isolated populations of kit foxes. Small populations have a higher probability of extinction than larger populations because their low abundance renders them susceptible to stochastic (i.e., random) events such as high variability in age and sex ratios, and catastrophes such as floods, droughts, or disease epidemics (Lande 1988; Saccheri et al. 1998; Cypher et al. 2014). Owing to the probabilistic nature of extinction, many small and isolated populations will go extinct when faced with these stochastic risks.

4.2 Least Bell's Vireo

Status. The least Bell's vireo (*Vireo bellii pusillus*) was listed as a Federally endangered species on May 2, 1986 (51 FR 16474). The final critical habitat designated in 1994 encompasses approximately 36,000 acres at ten localities in portions of Santa Barbara, Ventura, Los Angeles, San Bernardino, Riverside, and San Diego Counties in southern California. Lake Success is outside the designated critical habitat.

Distribution. The least Bell's vireo is a small gray migratory songbird whose historical range extended from Baja California, Mexico, to the northern Sacramento Valley of California, and from the California coastal ranges east to Death Valley. Riparian habitat losses and increases in

brown-headed cowbird populations starting in the 1930s eventually caused the vireo to become essentially extinct north of the Transverse Ranges of southern California (Grinnell and Miller 1944; Gaines 1974; Goldwasser et al. 1980; Garrett and Dunn 1981; USFWS 1986). Although still absent from major portions of its historical range, the vireo has responded well to conservation management actions. In a 5-year status review, USFWS (2006) determined that the number of occupied vireo territories had increased ten-fold (291 to 2,968) since the 1986 listing.

Corps surveys in 2014 detected least Bell's vireo at Lake Success (Figure 15). At least two Bell's vireo territories/breeding pairs were observed and recorded within the Tule River riparian area (Stewart 2014). Prior dry years had allowed dense riparian and woodland vegetation to regenerate and become established in areas well below the gross pool elevation where it would normally be inundated.

Life History and Habitat Requirements. The least Bell's vireo is one of four recognized subspecies of Bell's vireo in the United States (AOU 1957). Least Bell's vireos are obligate riparian breeders, nesting along stream courses typically dominated by willows (*Salix* spp.), cottonwoods (*Populus* spp.), oaks (*Quercus* spp.), and/or mule fat (*Baccharis salicifolia*). In California, this subspecies is strongly associated with riparian stands with dense understory vegetation between about 2 and 10 feet above the ground (Brown 1993; Kus 2002). Vireos occur in disproportionately high frequencies in the wider sections (greater than 250m) of the riparian relative to site availability (RECON 1989).

Vireos spend the winter in southern Baja California, Mexico, and arrive on breeding grounds in California in March or April (USFWS 1998c; Kus 2002). Grinnell and Miller (1944) reported later arrival (early April) for historic northern California populations. The key structural components of suitable breeding habitat are a dense layer of vegetation within 3-6 ft of the ground and a canopy layer (USFWS 1994; Kus 2002). Nesting least Bell's vireos prefer early and mid-successional riparian habitats that contain low, dense, shrubby vegetation. Nests are typically built of leaves, bark, willow catkins, and spider webs in a fork of a tree or shrub within 3 feet of the ground (Franzreb 1989). A clutch of 3-4 eggs is incubated by both parents for 14 days, and nestlings leave the nest at about 12-14 days, after which time they are cared for by the parents for another 2 weeks or more. Vireos may make multiple nesting attempts after nest failure but typically produce no more than one successful clutch during a season (Franzreb 1989). Most vireos leave the breeding grounds for Mexico by late September or earlier (Franzreb 1989).

4.3 Southwestern Willow Flycatcher

Status. The southwestern willow flycatcher (*Empidonax traillii extimus*) was listed as a Federally endangered species on February 27, 1995 (68 FR 10485). Additionally this subspecies are designated as Sensitive species in California by the U.S. Forest Service (USFS) Region 5, and by the USFWS Region 1. The final critical habitat designation includes 1,227 floodplain miles in California, Arizona, Nevada, Utah, Colorado, and New Mexico encompassing a total area of approximately 208,973 acres within the 100-year floodplain or flood-prone areas. Lake Success is outside the designated critical habitat area.

Distribution. Southwestern willow flycatchers are neotropical migrants that breed in patches of riparian habitat throughout the American southwest. This southernmost subspecies of willow flycatcher is found south of the Owens Valley, the South Fork Kern River, and the Santa Ynez River. Their breeding habitat currently ranges from southern California, through southern Nevada, southern Utah, Arizona, New Mexico, southwestern Colorado, and historically included western Texas and extreme northwestern Mexico. They travel south to winter ranges in Mexico, Central America, and northern South America. Within the range of southwestern willow flycatchers northbound migrants traveling to central and northern California and points north pass through areas where resident southwestern willow flycatchers are already breeding in Late May and early June. This creates confusion during southwestern willow flycatcher surveys because migrating birds often sing at their stopover locations (Sogge et al. 1997a). While their current distribution is similar to their historic range, southwestern willow flycatcher population numbers have declined precipitously in response to the loss of suitable riparian habitat throughout the region.

The greatest historical factor in the decline of the willow flycatcher is the extensive loss, fragmentation, and modification of riparian breeding habitat. Large-scale losses of wetlands have occurred, particularly those associated with riverine systems in both valley and montane settings (Johnson and Haight 1984; Unsicker et al. 1984; Johnson et al. 1987). Changes in the hydrology and riparian plant community have reduced, degraded and eliminated nesting habitat for the willow flycatcher, contributing to its decline in distribution and numbers (Serena 1982; Taylor & Littlefield 1986; Unitt 1987; Schlorff 1990). Habitat losses and changes have occurred (and continue to occur) because of urban, recreational, and agricultural development, water diversion and impoundment, channelization, livestock grazing, and replacement of native habitats by introduced plant species (Klebenow & Oakleaf 1984; Katibah 1984; Dull 1999). Hydrological changes, natural or man-made, can greatly reduce the quality and extent of willow flycatcher habitat (Sogge et al. 1997b).

There is roughly 160 acres of willow riparian woodland where the Tule River flows into Lake Success that is adequate southwestern willow flycatcher habitat (Figure 15). It covers an extensive area at the mouth of the river, primarily in areas that are presently inundated by periodic high lake levels during most years. Black willow (*Salix gooddingii*) is the dominant tree species (Stewart 2014). Most recent Corps surveys have not detected willow flycatchers of any subspecies at Lake Success (Stewart 2014). These surveys followed USFWS standard protocols (Sogge et al. 1997b; USFWS 2000). However, in 2005, Jones and Stokes biologists under contract by the Corps observed a single bird for approximately 15 minutes that was positively identified as a willow flycatcher, although it did not vocalize and therefore cannot be considered a positive detection under the USFWS's survey protocol (Sogge et al. 1997b; USFWS 2000). The willow flycatcher was not observed again during subsequent surveys during 2005 (Stewart 2014). This bird would be classified as a probable migrant under the USFWS's protocol, meaning that it was probably a subspecies of willow flycatcher other than the federally-listed southwestern willow flycatcher and that it was only in the study area temporarily while migrating to more northern areas. The federally listed subspecies of willow flycatcher (*E. t. eximus*) is not known to occur north of the Kern River in the western Sierra Nevada, although it does occur in desert riparian habitats in Owens Valley in the eastern Sierra Nevada (69 Federal Register [FR] 60706-60786).

Life History and Habitat Requirements. The southwestern willow flycatcher is a small passerine less than 15 cm long from the tip of its bill to the tip of its tail. It has a brownish-olive to gray-green upper body, a whitish throat contrasting with a pale olive breast, a pale yellow belly, and two light wing bars. Males and females do not differ in plumage, but juveniles differ from adults by having buffy wing bars. Southwestern willow flycatchers require moist microclimatic and vegetative conditions, and breed only in dense riparian vegetation near surface water or saturated soil. While wet conditions are uniformly required, the structure and species of vegetation in which they nest vary by region and availability. The birds frequently build nests in nonnative tamarisk (*Tamarix* spp.), as well as in native willow (*Salix* spp.), typically in vegetation stands of 4–7 m in height. Nesting habitat patches can range widely in size, from as small as 0.6 ha to as much as 200 ha, although the majority of patches tend towards the smaller end of the range.

Regardless of the plant/hydrologic combination, riparian/meadow sites used by breeding willow flycatchers vary in size and shape, and may contain relatively dense, linear, stands of shrubs, or irregularly-shaped mosaics of dense vegetation with open areas in between. Willow flycatcher territories generally contain open water, boggy seeps, or saturated soil. Although these territories all tend to have some surface water early in the season, the amount that persists through the summer can vary widely from year to year depending on: the snowpack (onsite and/or upstream), the hydrology, and the ability of the soils at the site to hold water (Ratliff 1985; Weixelman et al. 1999). At some southwestern willow flycatcher sites, vegetation may be immersed in standing water during a wet year, but be hundreds of meters from surface water in dry years, this is particularly true of reservoir sites. At other breeding sites where the river channel has been recently modified or the river channel has changed naturally, there may be a total absence of water or visibly saturated soil for several years. However, it is not known how long such sites will continue to support riparian vegetation and/or remain occupied by breeding willow flycatchers (Sogge et al. 1997b).

Southwestern willow flycatchers spend only 3–4 months of the year paired with a mate for the breeding season. They defend a small (typically <1 ha) breeding territory during this time, which is often clumped with nearby territories of other flycatchers in a semi-colonial fashion. They can occur singly or near other flycatchers during migration and on the wintering grounds. Males often exhibit site fidelity by returning to the general area of the previous year's breeding grounds. Because of the dynamic nature of riparian habitat, however, (a single flood can destroy an entire patch), flycatchers are known to move among sites in their breeding grounds, either within the same year or from year to year. Southwestern willow flycatchers usually pair with a single mate during the breeding season, although polygyny (multiple female mates) has been documented at low rates. Males arrive on breeding grounds in late April to early May to establish territories, approximately 1–2 weeks before the females arrive. After pairing, the female builds an open cup nest from leaves, grass, fibers, feathers and animal hair, approximately 9.5 cm high and 8.5 cm wide (outside dimensions), exclusive of any dangling material at the bottom (Sanders & Flett 1989; Bombay 1999). Nests are typically placed in the fork of a branch with the nest cup supported by several small-diameter vertical stems. Nests are placed at an average of 4.6 m in height, but they can range from 1–12 m. Nest height also varies considerably and may be correlated with height of nest plant, overall canopy height, and/or the height of the vegetation strata that contains small twigs and live growth (Sogge et al. 1997b). In late May to early June,

the female lays 3–4 buffy eggs with brown markings in a circle at the blunt end of the egg. She incubates them for 12–15 days, and then both the female and male tend the young during the 12–15 day nestling stage. After fledging, young stay close to the nest for a few days, and do not leave the natal area for at least 14–15 days. During this time, both adults respond to the loudly begging fledglings by bringing them food. Some pairs will attempt to raise a second brood later in the season, particularly if their first nesting attempt fails. Nests with eggs have been observed as late as 30 August, with nestlings into mid-September.

Second clutches after a successful first nest are occasionally reported for the southwestern willow flycatcher. Willow flycatchers often attempt a second and even third nest after nest failures (Bombay 1999, Morrison et al. 1999). Replacement nests are built in the same territory, either in the same nest plant or at a distance of 30 m or more from the previous nest. Frequently, willow flycatchers will disassemble failed nests in order to build new nests (McCabe 1991). On a few occasions re-nesting flycatchers have been known to reuse the same nest in a single year (Yard & Brown 1999). In California, replacement nest building and egg laying can occur (uncommonly) as late as early August (Stafford & Valentine 1985, Sanders & Flett 1989) (Figure 16). Clutch size (and therefore potential productivity) usually decreases with each nest attempt (Whitfield and Strong 1995). Breeding populations may also reappear at unoccupied sites following 1-5 yr. absences (Sogge et al.1997a). Therefore, one cannot assume that a habitat is unsuitable or unoccupied in the long-term based on flycatcher absence during only a single year, especially if there is evidence of recent occupancy.

4.4 San Joaquin Adobe Sunburst

Status. The San Joaquin adobe sunburst (*Pseudobahia peirsonii*) was federally listed as threatened on February 6, 1997 (USFWS 1997; 62 FR 5542). The San Joaquin adobe sunburst is State-listed as endangered. No formal designation for critical habitat has been designated for this species.

Distribution. San Joaquin adobe sunburst, a member of the tarweed tribe, are restricted to heavy, adobe clay soils with slight slopes on valley floors and rolling hills in scattered location in northern Kern County, Tulare, and Fresno Counties (USFWS 2007). It is endemic to the eastern San Joaquin Valley and its historic range is unknown (Stebbins 1991). The population currently is limited to about 41 extant occurrences in valleys and flats and in the foothills of the Sierra Nevada (CDFW 2019). Extant populations are concentrated in three areas: the Round Mountain-Wahtoke area in Fresno County, the Porterville-Visalia region in Tulare County, and the Pine Mountain-Woody region in Kern County (USFWS 1992, 1997).

San Joaquin adobe sunburst are usually found on Porterville clay soil series, but can be found less frequently on Academy, Centerville, Cibo and Mt. Olive clay soil series (Stebbins 1991). Growing in areas where the average annual rainfall is less than 10 inches, these soils may be favored by the San Joaquin adobe sunburst for their ability to hold moisture longer into the summer dry season than other soils (Stebbins 1991). It occurs at elevations ranging from 390 to 2,600 feet above mean sea level primarily in annual grassland plant communities, but sometimes in annual grassland-blue oak woodland ecotone communities (Stebbins 1991). San Joaquin adobe sunburst grows in grasslands dominated by non-native annual grasses, mustards, and

filarees. The intrusive and aggressive nature of these herbaceous weeds appears to be detrimental to the quality of habitat for the San Joaquin adobe sunburst. Common associates within the study area include wild oat (*Avena fatua*), red brome (*Bromus madritensis* ssp. *rubens*), common fiddleneck (*Amsinckia menziesii* var. *intermedia*), soft chess (*Bromus hordeaceus*), redstem filaree (*Erodium cicutarium*), and charlock (*Sinapis arvensis*) (USFWS 2007).

Of the 51 historically known occurrences of San Joaquin adobe sunburst, 10 have been or are now presumed to be extirpated, all in Tulare County. Of those 10, three occurrences have been or are presumed to have been extirpated since 1999 (CDFW 2019). Approximately 80 percent of the remaining plants of this species are contained in 4 populations and 18 of the 41 extant occurrences contain less than 250 plants in a given year (CDFG 2001). Populations continue to be threatened by agricultural activities, urbanization, water projects, transmission line and road maintenance, soil erosion, livestock grazing, and competition with non-native weeds (CDFG 1992; USFWS 1992).

The extant population at Lake Success is considered in fair condition and is a remnant population of a larger one that used to occupy an area that is now part of Lake Success (Figure 17). The Lake Success population of San Joaquin adobe sunburst has varied from 50 to over 300 individual plants covering an estimated 3-acre area along the west side of Lake Success (Stebbins 1991). An extensive vegetation survey conducted at Lake Success in the spring of 2006 by EDAW, Inc., reported an undocumented occurrence of San Joaquin adobe sunburst on the southwest side of Boat Island, which included 45 individuals (Unger and Beyerl 2006). This same survey documented approximately 150 individuals on the west side of Lake Success in two general locations (corresponding to CNDDB occurrences 19 and 46).

Part of Occurrences 10, 19 and all of Occurrence 46 lie within the temporary work area for Phase 1 (Figure 18). Occurrence 19 was generally mapped in 2002 by Dr. Ellen Cypher as three polygons (Unger and Beyerl 2006; CDFW 2019). Unger and Beyerl used GPS technology to get a more accurate location in 2006 (Figure 18). Occurrence 10, west of the spillway along Avenue 146, was first reported in 1974. Occurrence 19, between Rocky Hill and Lake Success, was first reported in 1938. Occurrence 46, immediately north of the spillway, was first reported in 2006. Occurrence 19 has not been documented since 2006, while Occurrence 46 was last documented in 2014. It is important to note that this species, as with most annuals, is cyclical and population sizes fluctuate greatly from year to year due to environmental variation (Stebbins 1991). In 2019, two previously undocumented populations were located near Frazier Dike and where the Tule River enters Lake Success. The new footprint of the water level caused by increasing the gross pool of Lake Success, coupled with wind and wave runup, could impact two occurrences of the San Joaquin adobe sunburst, one approximately every 10 years and the other approximately every 100 years (these details will be confirmed with LiDAR and on-the-ground elevation surveying in early 2020). Locations affected include part of the Rocky Hill historic subpopulation and the newly discovered occurrence 800 feet south of Frazier Dike.

Life History and Habitat Requirements. This annual herb species is a member of the aster family (Asteraceae) and has woolly gray stems and foliage (USFWS 1998a; Johnson 2012. The erect stems are typically from 4 to 18 inches tall. The alternate leaves are divided twice into smaller lobes (bipinnatifid), are triangular in outline, and 1 to 3 inches long (Johnson 2012). San Joaquin

adobe sunburst (also called Tulare pseudobahia) is distinguished from other species of *Pseudobahia* by characteristics of the phyllaries and leaves (USFWS 2007). Each plant produces a single head of yellow disk and ray flowers at the ends of the branches between March and May. The San Joaquin adobe sunburst requires sufficient rainfall; therefore, during drought years population sizes decrease substantially. Additionally, the timing of grazing can impact the success of the species (Stebbins 1991; USFWS 2007).

5.0 ENVIRONMENTAL BASELINE AND CUMULATIVE EFFECTS

This section will be used along with the species and critical habitat information from the preceding section to describe the pre-action condition of the species and critical habitat that will be exposed to the stressors and subsidies of the action(s) under consultation. The purpose of this section is also to provide a summary of the relevant local information on the impacts that other factors (human and natural) in the action area have had on the viability of the species and value of critical habitat. These other factors may have occurred in the past, may continue to affect the species and habitat today, or will affect the species and habitat in the future.

The information contained in this section is based upon field reconnaissance, literature searches, and database queries. The aerial photographs, CNDDB, and IPaC were reviewed prior to field reconnaissance visits. In addition to these references, Corps biologists reviewed species literature. All of the above were used to determine the potential for the species listed in Table 1. Field surveys (December 2018, February 2019, and April 2-4, 2019) included recording existing biological resources in and round the Action Area, assessing the Action Area for suitability to support federally listed and candidate species. Habitats were mapped and field notes were recorded.

5.1 Environmental Baseline

Lake Success is located within the foothills of the southern Sierra Nevada mountains. Northwest and southwest trending hills and broad valleys typify the area. The foothill belt is 12 miles wide and merges with increasing relief into the Sierra Nevada mountains. The Tule River is the major stream in this area, with about 390 square miles of Tule River drainage above Lake Success. The valley area downstream of the dam is relatively flat due to alluvial deposits from the river. The Tule River flows from the reservoir through Porterville, and continues thirty-eight miles through agricultural areas to Tulare Lakebed (Figure 2).

The Tulare Lakebed is part of a closed interior drainage system with no access to discharge into the sea. The lakebed is located towards the south end of the San Joaquin Valley, where it receives water from the Kern, Tule, and Kaweah Rivers, as well as from southern distributaries of the Kings River. It was separated from the rest of the San Joaquin Valley by tectonic subsidence and alluvial fans extending out from Los Gatos Creek in the Coast Ranges and the Kings River in the Sierra Nevada. Above a threshold elevation of 207 to 210 feet, it can overflow into the San Joaquin River; however, no overflows have occurred after 1878 due to increasing diversions of tributary waters for agricultural irrigation and municipal water uses. The Tulare lakebed was dry by 1899, except for residual wetlands and occasional floods. Over time, the decreasing lake size allowed agriculture to move into the productive lakebed deposits in

the valley. Due to the closed nature of this system, high water years have a potential to flood agricultural lands in the lakebed.

For Phase 1, the proposed action/temporary work area is currently recreation land (parking lots and boat ramps), roads, and pastured annual grassland (Figure 1). Pastured annual grassland covers 99 acres of the Phase 1 temporary work area, while roads and recreation land cover 39 acres. Within the actual construction footprint (~14 acres), 8.4 acres are pastured annual grassland, and 5.6 acres are existing roads. The soils are mostly clay textured and are shallow to bedrock (Figure 19; Soil Survey Staff). Soil surveys indicate that bedrock is typically encountered 9 to 35 inches below the soil surface (Soil Survey Staff).

For Phase 2, construction of the ogee weir would occur within the newly enlarged spillway. Flood-proofing, protection, and relocation of existing infrastructure would occur within the recreation areas, which are mostly mowed lawn, pavement, and ornamental trees. Blasted rock from Phase 1, would be used to armor Frazier Dike and the abutments of the State Highway 190 bridge (Figure 3). The Frazier Dike levee is mostly bare soil with spotty ruderal vegetation. Current routine maintenance involves periodic removal of herbaceous vegetation. The abutments of the State Highway 190 bridge are currently dominated by wild radish (*Raphanus sativus*), tumbleweed (*Salsola* spp.), and protective riprap. Ten feet of blast rock will be added upslope from the existing riprap to further armor the bridge abutments. Raising the fourteen transmission towers and 11,800 feet of power lines to meet minimum clearance criteria would temporarily impact the existing powerline right of way, which currently cuts through existing and future inundated areas.

The extant population of San Joaquin adobe sunburst at Lake Success is considered in fair condition. It is a remnant population of a larger one that used to occupy an area that is now part of Lake Success. The adobe sunburst successfully blooms during locally high rain years at Lake Success. The local population of the plant is not dependent on the flow regime or pool elevation in the locations it has been found. The Lake Success extant population of adobe sunburst has varied from 50 to over 300 individual plants in four different areas covering an estimated 10-acre area along the west side of Lake Success and Boat Island (Occurrences 10, 19, 46, & 45; Figure 18 and Table 2). In addition, there is a small population on the south side of the inlet where the South Fork of the Tule River enters Lake Success (USFWS 2007). Between April 2 and 4, 2019, a biological survey was conducted between the current and future maximum pool depths at Lake Success. Two new occurrences of adobe sunburst were found; one along the Tule River where it enters Lake Success and the other 800 feet south of Frazier Dike.

Occurrence 46 would be directly impacted by the proposed action since its documented location is directly under where the new road will go (Figure 7). However, this occurrence may no longer be extent since it has not been documented in three past surveys (2016, 2017, & 2019) and was last observed in 2014 (Table 2). Regular grazing by cows and horses on private land and by goats and/or sheep on Corps lands could have eliminated this occurrence. The main stockpile is located near the mapped extent of Occurrence 19. The specific location of the stockpile was moved during project design to avoid this occurrence, which has not been documented since 2006. The stockpile is currently outside a 25-foot buffer zone created around this mapped occurrence. This occurrence has also undergone extensive grazing by horses, cattle, goats, and sheep.

Furthermore, the seedbank may no longer be viable since related plants in the tarweed tribe are reported to have seed that only remain viable up to five years (Montalvo et al. 2010). No known seed viability studies have been conducted on adobe sunburst to date.

Eleven occurrences of San Joaquin kit fox have been documented within 10 miles of the proposed action; kit fox has been documented in the surrounding quads, each greater than 5 miles from the proposed action (CDFW 2019). The last occurrence was documented in 1992. Satellite populations of kit foxes, like those near Lake Success, are prone to extinction (Cypher et al. 2014). Furthermore, suitable, not preferred, habitat is present in the project area and the project area is at the edge of San Joaquin kit fox's current known range. However, it is possible that kit fox may still use the area for foraging or as a movement corridor. Based on field surveys in December 2018 and February 2019, a multitude of dens were located around the project area; most were last inhabited by ground squirrel, some were recently inhabited by rabbits, and a few had been inhabited by fox (unknown species). An active fox den was located at the base of the right abutment during surveys in February 5, 2019, although the species was not determined as the tracks were only of nail scrapes. The shallow-to-bedrock soils within the project area preclude natal dens since the soils have a maximum depth of 2.9 ft (Soil Survey Staff) and dens are typically located 4.3 ft to almost 10 ft below the soil surface (Egoscue 1956; Morrell 1972; O'Neal et al. 1987).

Orchards occur in large contiguous blocks to the northwest of Lake Success, north of Frazier Dike, and at scattered locations to the southwest (Figures 1 and 5). Orchards sometimes support prey species if the grounds are not manicured; however, denning potential is typically low and kit foxes can be more susceptible to coyote predation within orchards (Zeiner 1990; USFWS 2010; USEPA 2013).

5.2 Cumulative effects

The ESA requires USFWS to evaluate the cumulative effects of the proposed actions on listed species and designated critical habitat, and to consider cumulative effects in formulating Biological Opinions. The ESA defines cumulative effects as "those effects of future State or private actions, not involving Federal activities that are reasonably certain to occur within the action area" of the proposed action subject to consultation. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of the Federal ESA. Federal actions, including hatcheries, fisheries, and land management activities are not included.

A number of other commercial and private activities, including agriculture, hatchery operations, timber harvest, recreation, and urban development could potentially affect listed species in the Tule River watershed. Levee maintenance activities by state agencies and local reclamation districts are likely to continue, although any effects on listed species would be addressed through Section 10 of the ESA. The benefit of the Tule River Spillway Enlargement Project's increased storage capacity would be to provide flood damage protection to infrastructure and environments downstream to the Tulare Lakebed by increasing the ability to control the release of high flows, reducing high river flow levee damages, therefore reducing the need for repairs.

6.0 EFFECTS OF THE ACTION

The action area addressed in this BA does not fall within designated critical habitat for any of the species listed in Section 1.1. There is No Effect on designated Critical Habitat.

The immediate effect of blasting is within 750 feet, and secondary effects would be within 2,500 feet, as indicated on Figures 5 and 6. The effects would vary due to the hilly terrain around Lake Success both focusing, reflecting, and attenuating the blast noise. Wildlife sensitive receptors in the immediate blast radius (750 feet) would be considered, although the likelihood of resident wildlife after the soil stripping would be minimal, leaving transient predators such as birds and lizards. Some wildlife in the larger 2,500 foot buffer zone around the demolition may be dissuaded from nesting/denning in the local area if nesting/denning coincides with the rigorous blasting. The nesting habitat available (trees) in the 2,500 foot blast zone is south of the Dam around the Corps Lake Success offices and an abandoned mobile home park. Also, migratory songbirds, raptors, waterbirds and shorebirds may have their migratory patterns shifted due to the disturbance. The frequency and number of detonations is not known at this time, as engineering is still compiling the geotechnical data. Most birds acclimatize quickly to disturbance if they are in a resting or nesting activities, but perching and foraging birds will more often adjust their behavior if the disturbance effects their activity. The disturbance to the animals decreases over repeated exposure if there are no negative effects noticed by the animals. There is energy budget loss due to the disturbance, but it is short term per blast decreasing with successive blasts (Pers. Obs. and Holthuijzen, et al. 1990.)

The increase in the gross pool elevation from 652.5 feet to 662.5 feet as a result of the spillway raise would expose an additional 659 acres of riparian and upland habitat around the lake to periodic inundation during years of well-above average precipitation.

Phase 2 of the project raises the emergency spillway 10 feet with a new ogee weir. This will reduce the 100-year flood flow through the spillway from approximately 4,700 cfs to 3,200 cfs (Appendix C). Since the downstream Tule River channel capacity immediately east and west of Hwy 99 ranges from 2,000 cfs to 1,000 cfs, respectively, flooding in these areas would still occur (Figures 12-14). Based on hydraulic modeling, no impacts to downstream habitat or wetlands would occur and the average change in water level during major floods across the Tulare Lakebed would be a reduction of only 0.001 inches (Appendix C). Thus the proposed action would have no effect on downstream listed species.

The spillway raise in Phase 2 would reduce flooding downstream of the lake along the Tule River floodplain, which is mostly comprised of intensive agriculture (Figure 14). It would also raise the existing potential maximum lake level ten feet, which would increase the area that has the possibility of periodically flooding with lake water (Figures 20 and 21). This could increase the portion of riparian vegetation along the Tule River and South Fork of the Tule River as they enter the lake. The existing 160-acre willow riparian woodland where the Tule River flows into Lake Success currently floods with lake water during wet years with little effect on the black willows, which are very tolerant of flooding. Black willows have an estimated 100 percent survival when inundated up to 60 days (Walters et al. 1980).

San Joaquin Kit Fox

The proposed action **May Affect, and is Likely to Adversely Affect** the San Joaquin kit fox due to indirect effects. Directly there are minimal permanent impacts from the project on biologically significant habitats since the project area only contains a minor amount of marginal habitat. Additionally, kit foxes have not been documented within 5 miles of the project area, the soils in the project area preclude the creation of natal dens, and no occurrences of kit foxes have been documented within 10 miles of the project area since 1992. If there are isolated kit foxes foraging in the area, the project actions may result in short term avoidance due to construction and blasting. Furthermore, the BMPs (both pre-construction surveys and avoidance and minimization measures) would avoid, minimize, or reduce potential interactions with kit fox.

The proposed action has the potential to temporarily block foraging habitat for the San Joaquin kit fox during periods of inundation. As a result of the spillway raise, the proposed action would increase the gross pool elevation from 652.5 feet to 662.5 feet, which would expose an estimated additional 659 acres of riparian and upland vegetation around the lake to periodic inundation during years of well-above average precipitation. This represents a permanent periodic loss of potential foraging habitat for kit foxes. The extent of this impact on the kit fox is unknown due to lack of information on species presence and the infrequent nature of such inundation.

Based on the 1999 BO, the Corps would provide compensation for the loss of 421 acres of grassland around the perimeter of the lake, by acquiring and preserving 425 acres of grassland. This grassland would be fenced and managed for wildlife. The Corps would provide compensation for the loss of 167 acres of *Atriplex* grassland habitat, which is now in the Kincade Cove Wildlife Management Area, by planting *Atriplex* community species on 150 acres of lands adjacent to the remaining wildlife management area, above the new gross pool. The area will be fenced to protect the plantings from livestock grazing. These lands would not be managed specifically for kit fox habitat, but would provide some kit fox habitat. These compensation requirements could change if the water control manual update indicates a reduced effect on the species habitats from the periodic inundation caused by the proposed spillway raise.

Cumulative effects with other actions. The downstream effects of the spillway enlargement of Lake Success would slightly decrease flooding effects for kit fox in the Tule River and Tulare Lakebed watershed (Figure 22). State and local activities are expected to continue (e.g., levee repairs, water diversions for irrigation). These cumulative effects on the San Joaquin kit fox are difficult to quantify.

Least Bell's Vireo

The proposed action **May Affect, but is Not Likely to Adversely Affect** the least Bell's vireo. All work from the proposed action would occur more than one-half mile from potential habitat for this species (Figures 3 and 15). Since this habitat is already within the existing gross pool of the lake, the periodic higher lake levels caused by the proposed action beyond the existing gross pool would not impact the habitat beyond current conditions. There is a chance that more habitat would be created (Figures 20 and 21) with higher lake levels. However, since the frequency of high water events is less than one percent each year, it is difficult to determine these beneficial

impacts. The suitable habitat for least Bell's vireo at Lake Success is more than 10,000 feet from the blasting. Blasting would occur after the nesting season for least Bell's vireo has ended in July and would cease before it begins again in April (Kus 2002). Thus the Corps expects there to be minimal impacts on least Bell's vireo from blasting.

Southwestern Willow Flycatcher

The proposed action **May Affect, but is Not Likely to Adversely Affect** the southwestern willow flycatcher. All work from the proposed action would occur more than one-half mile from potential habitat for this species (Figures 3 and 15). Since this habitat is already within the existing gross pool of the lake, the periodic higher lake levels caused by the proposed action beyond the existing gross pool will not impact the habitat beyond current conditions. There is a chance that more habitat would be created (Figures 20 and 21) with higher lake levels. However, since the frequency of high water events is less than one percent each year, it is difficult to determine these beneficial impacts. The suitable habitat for southwestern willow flycatcher at Lake Success is more than 10,000 feet from the blasting. Blasting would occur after the species typically departs in summer and would cease before the species returned in last spring (Sogge 1997b; USFWS 2013). Thus the Corps expects there to be minimal impacts on southwestern willow flycatcher from blasting.

San Joaquin Adobe Sunburst

For Phase 1, the proposed action **May Affect, and is Likely to Adversely Affect** San Joaquin adobe sunburst. Although this annual species has not been documented within the construction footprint since 2014 and mitigation measures will be taken if plants are found during final pre-construction surveys in spring 2020, the new road alignment will destroy known habitat for this species.

The project actions may directly harm one occurrence of San Joaquin adobe sunburst (number 46, Figure 18 and Table 2), which has potentially already been eliminated by grazing. This occurrence was known to occur where the new road will be located. Further occurrences, not in the California Natural Diversity Database or IPaC, were discovered on April 2-4, 2019. One occurrence is two miles from the project area along the Tule River before it enters Lake Success. This occurrence is above the new projected gross pool and would not be directly or indirectly impacted by the project. The other occurrence is 800 feet south of Frazier Dike. It is away from any proposed haul routes (>250 ft) and the power lines transmission towers (>2500 ft). Based on elevation map contours, there is the potential for part of this occurrence of adobe sunburst to be periodically inundated if wind and wave runup are high enough after the spillway raise occurs, with unknown effects. However, the final designs, wind and wave runup analysis, and elevation surveys for Phase 2 are not complete. If final designs change the affects determination, the Corps would reinitiate consultation with USFWS.

Cumulative effects with other actions. The spillway enlargement might raise the pool to an elevation that would affect San Joaquin adobe sunburst. Based on current understanding, this would occur with a less than 1 percent probability each year and the impacts to this species are unknown. The newly found Frazier Dike population might have been inundated during high lake

levels in 2017. However, more than 1,000 species were seen in 2019. Heavy wind and wave action may cause the pool to shift into the population locations, but the likelihood is low due to the seasonality of severe storms in the area not coinciding with the higher pool levels. State and local activities are expected to continue upstream, while downstream has little to no habitat for this species. State and local activities are expected to continue (e.g., levee repairs, water diversions for irrigation), but these populations are on Federal land and would not be affected by non-Federal actions.

7.0 CONCLUSION

The proposed action May Affect, but is Not Likely to Adversely Affect both the least Bell's vireo and the southwestern willow flycatcher. All work from the proposed action would occur more than one-half mile from potential habitat for these two species. This habitat currently floods during wet years and the frequency of such flooding would not be impacted by the proposed action. A minimal amount of additional riparian habitat could be created by the project.

The indirect effects of the increase in gross pool elevation would periodically deprive any potential area kit foxes of foraging habitat. As a result, this project May Affect, and is Likely to Adversely Affect the San Joaquin kit fox. The downstream effects of the spillway enlargement of Lake Success would decrease flooding effects for kit fox in the Tulare Lakebed watershed. State and local activities are expected to continue (e.g., levee repairs, water diversions for irrigation).

The spillway enlargement is not likely to raise the pool to an elevation that would affect San Joaquin adobe sunburst. Heavy wind and wave action may cause the pool to shift into the population locations, but the likelihood is low due to the seasonality of severe storms in the area not coinciding with the higher pool levels. State and local activities are expected to continue upstream (e.g., levee repairs, water diversions for irrigation), while downstream has little to no habitat for this species. These populations are on Federal land and would not be effected by non-Federal actions. As the species cannot avoid environmental changes, this project May Affect, and is Likely to Adversely Affect San Joaquin adobe sunburst populations.

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10.0 FIGURES AND TABLES

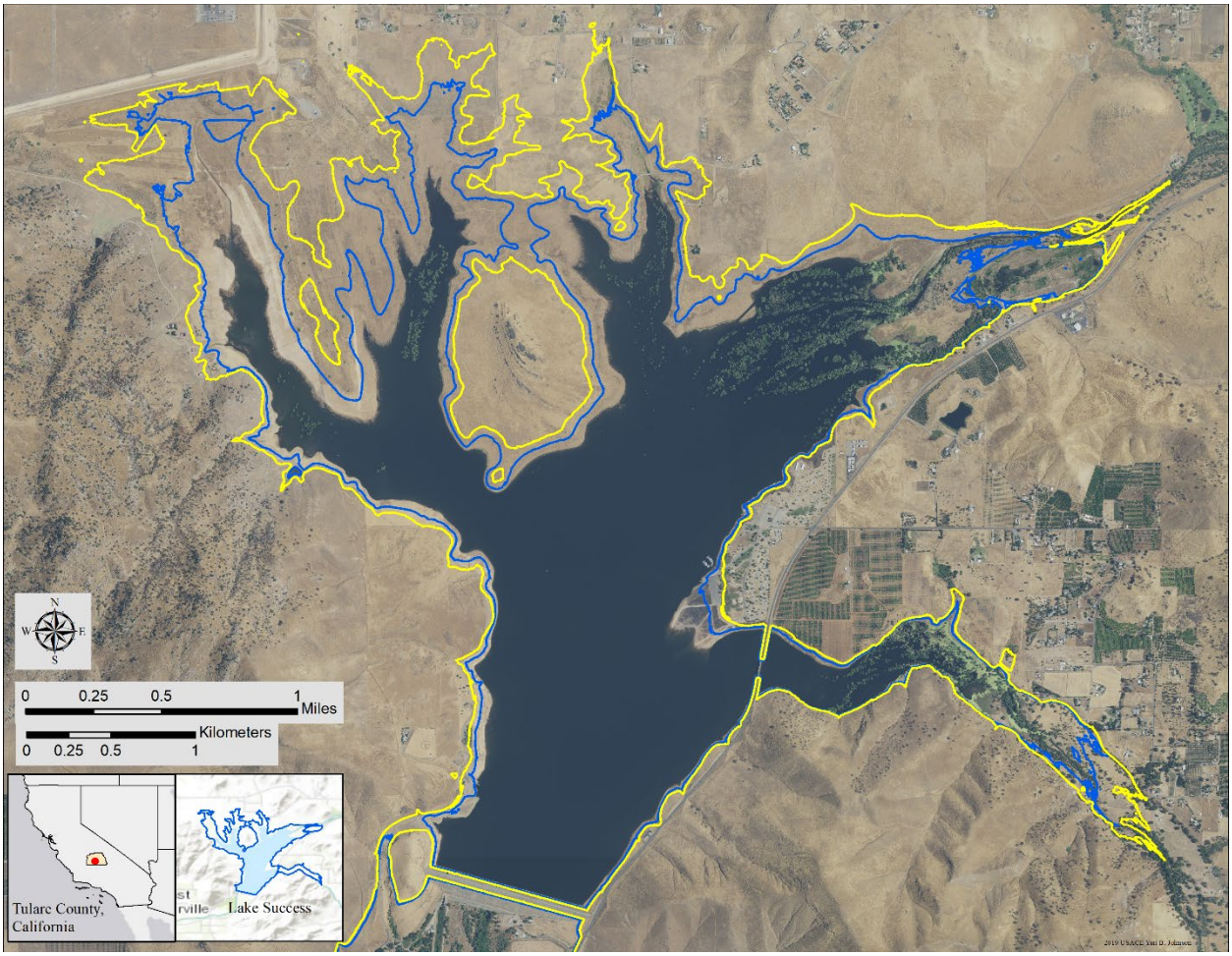

Figure 1. Lake Success with existing potential maximum lake level approximated by the blue contour line (652.5 ft). Proposed potential maximum lake level approximated by the yellow contour line (662.5 ft). The existing maximum lake level has been reached seven times since the dam was constructed in 1961. The Corps estimates that there is a one percent chance each year that the proposed potential maximum lake level will be reached. In other words, the one percent annual chance of exceedance flood ("100-year flood"). Final physical/hydraulic models coupled with LiDAR and on-the-ground surveys will be completed in early 2020 and would give a better estimate of future lake levels.

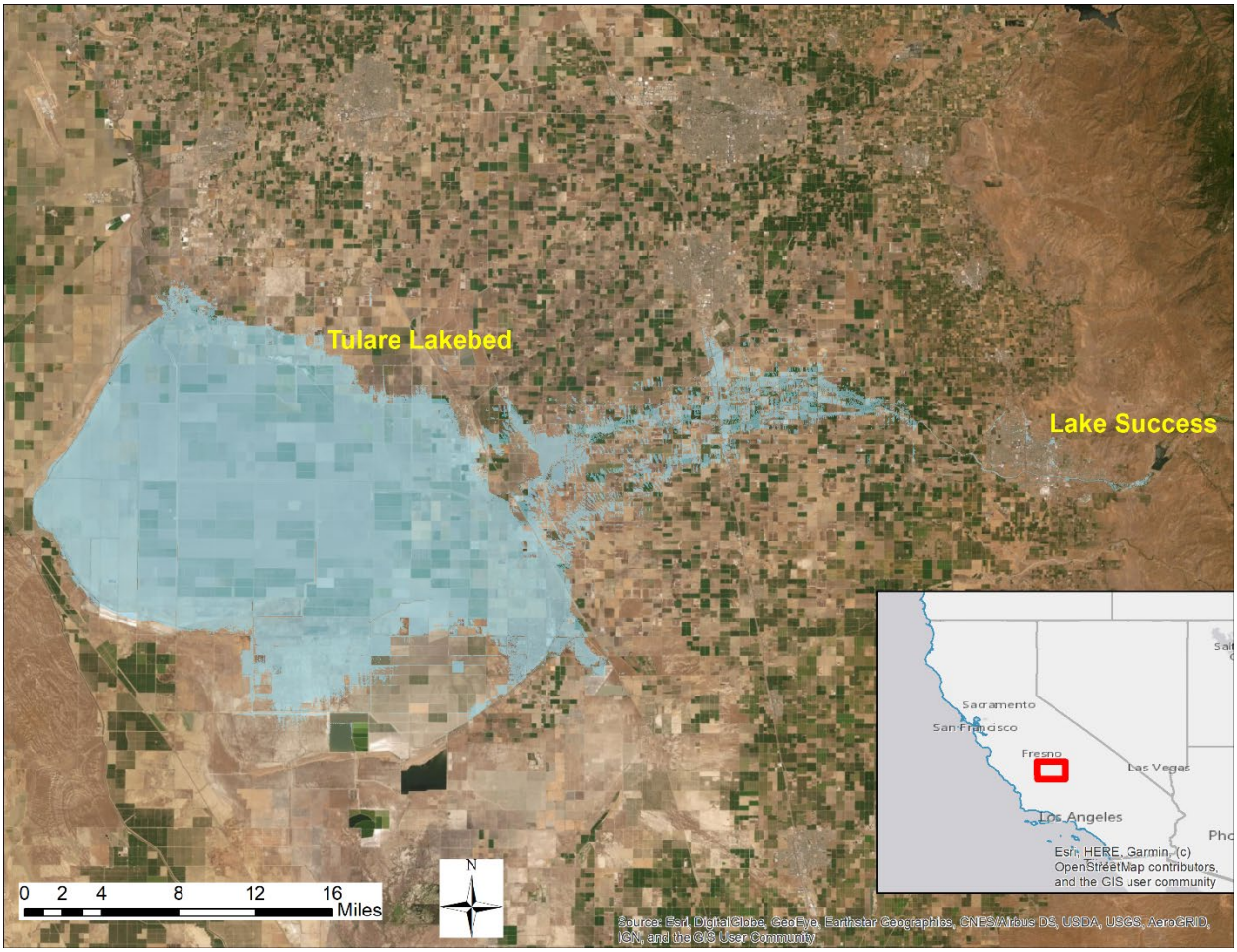

Figure 2. Lake Success with existing downstream 100-year floodplain shown in light blue. Flood area based on modeling, which is detailed in Appendix C. The area in light blue approximates the one percent annual chance of exceedance flood.

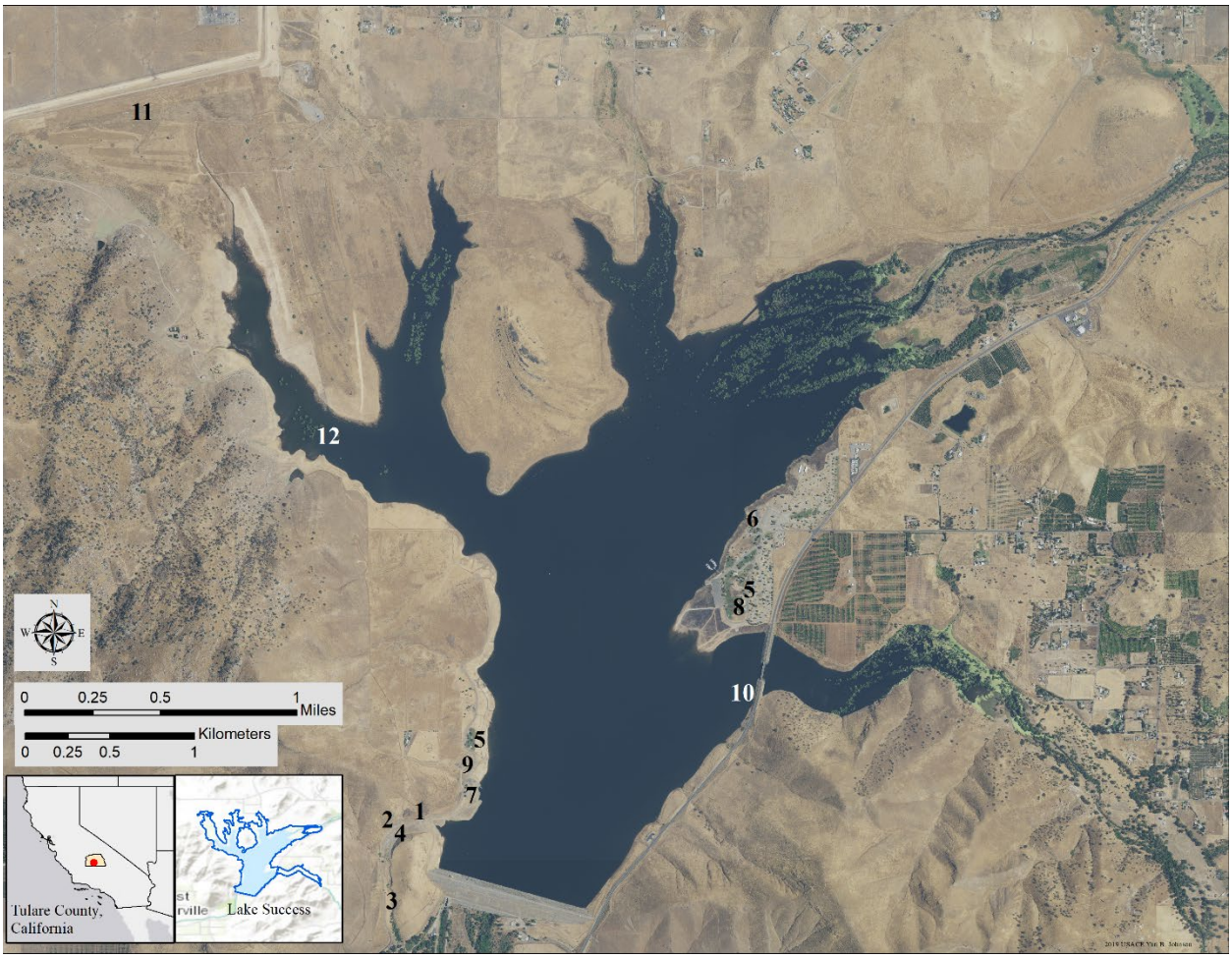

Figure 3. Overview of Lake Success with components of Proposed Action numbered. (1) Widening the spillway sill at Success Dam from 200 feet to 365 feet. (2) Relocating the existing road through the spillway, Worth Drive/Avenue 146, to the new road bench constructed as part of the spillway widening. (3) Restoring the lower third of the spillway to its original design grade using excavated material from the spillway widening. (4) Constructing a 10-foot high concrete ogee weir over the existing spillway sill. (5) Flood-proofing restrooms at the Tule and Rocky Hill recreation areas. (6) Extending and widening the Tule recreation area boat ramp. (7) Enlarging the existing parking area at Rocky Hill recreation are to replace parking areas lost to higher gross pool levels. (8) Protecting in place the Tule recreation area well and storage tank by an earthen berm. (9) Relocating the Rocky Hill recreation area storage tank, well, and metal shed to higher ground. (10) Placing rock revetment along the State Highway 190 bridge abutments for erosion protection. (11) Placing rock revetment (3,500 linear feet) along Frazier Dike for erosion protection. (12) Raising fourteen transmission towers and 11,800 feet of power lines to meet minimum clearance criteria.

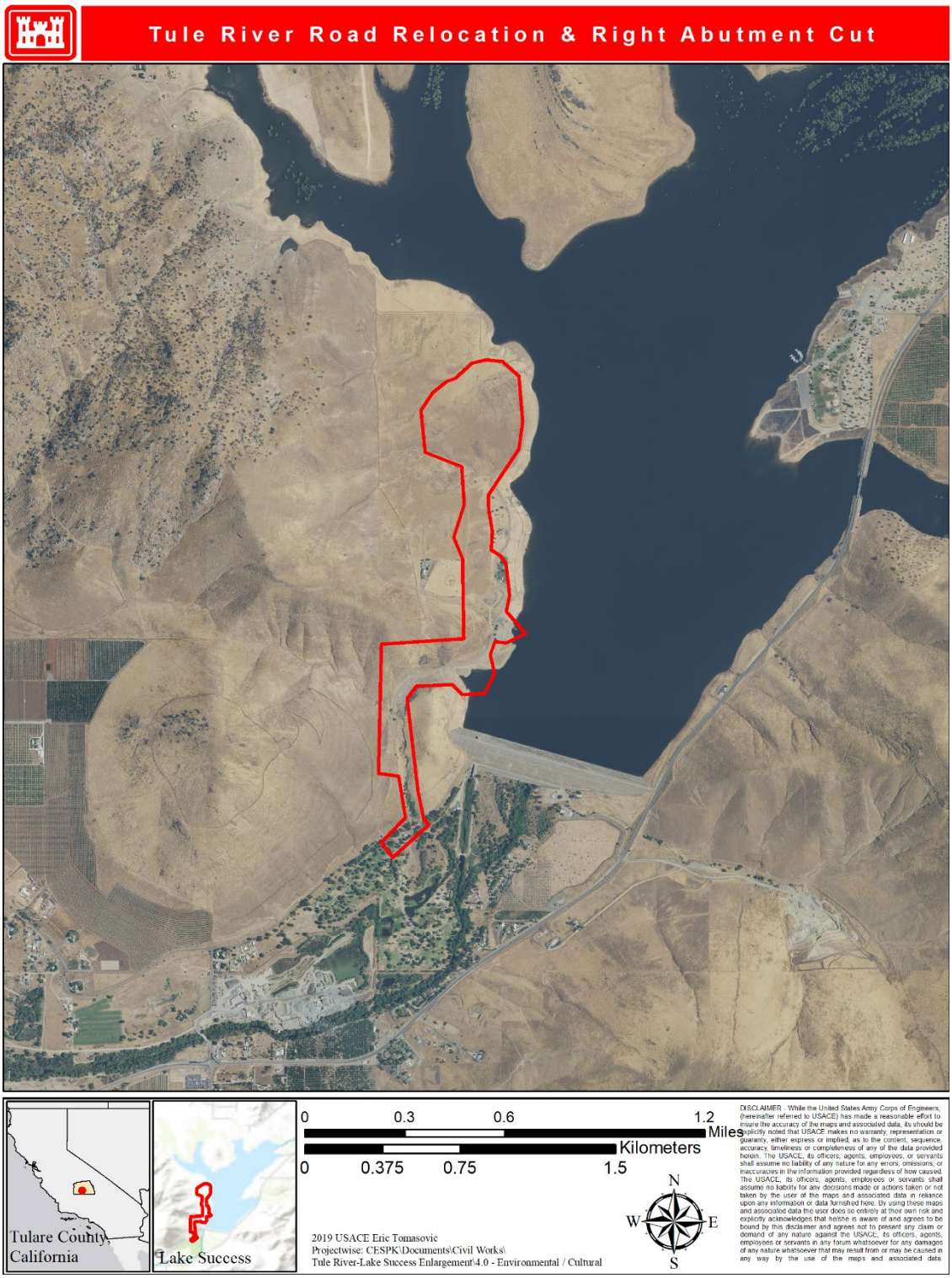

Figure 4. Proposed action temporary work area (red outline) along the western shore of Lake Success for Phase 1.

Figure 5. Overview of the emergency spillway on the southwest corner of Lake Success. The spillway will be widened 165 feet by blasting and excavating the right abutment (top side of the spillway in this figure). Worth Drive/Avenue 146 (white line) currently goes through the spillway and will be relocated onto a bench above the new, wider spillway.


Figure 6. View of spillway from Lake Success. Phase 1 involves blasting and excavating the right abutment of the spillway. Worth Drive/Avenue 146 is adjacent to the right abutment.

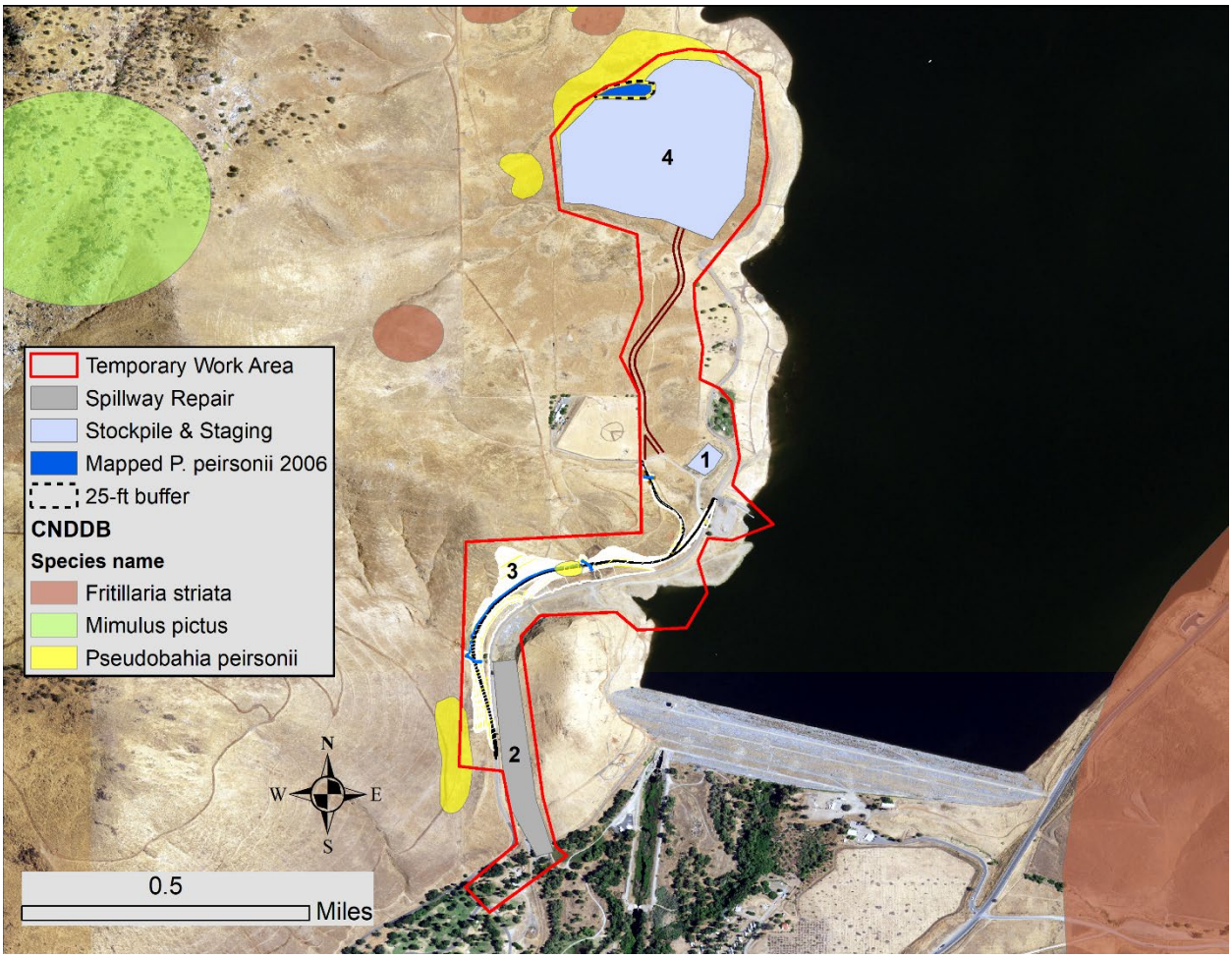

Figure 7. Overview of the proposed action project area for Phase 1 with occurrence of federally-listed species (CDFW 2019). (1) The staging area and construction offices will be located near the Rocky Hill Recreation Area on Corps property. (2) Blast rock from the right abutment cut will be used to repair the emergency spillway grade. (3) Right abutment cut and road realignment (see Figure 9 for a close up of the cut and road realignment). (4) Stockpile location. Stockpile (4) will be located at least 25 feet from the mapped San Joaquin adobe sunburst (*Pseudobahia peirsonii*) locations shown in dark blue. Brown line between 1 and 4 represents a temporary haul road. Striped adobe lily (*Fritillaria striata*) and calico monkeyflower (*Mimulus pictus*) are only shown for informational purposes. They are not impacted by the proposed action from either Phase 1 or Phase 2.

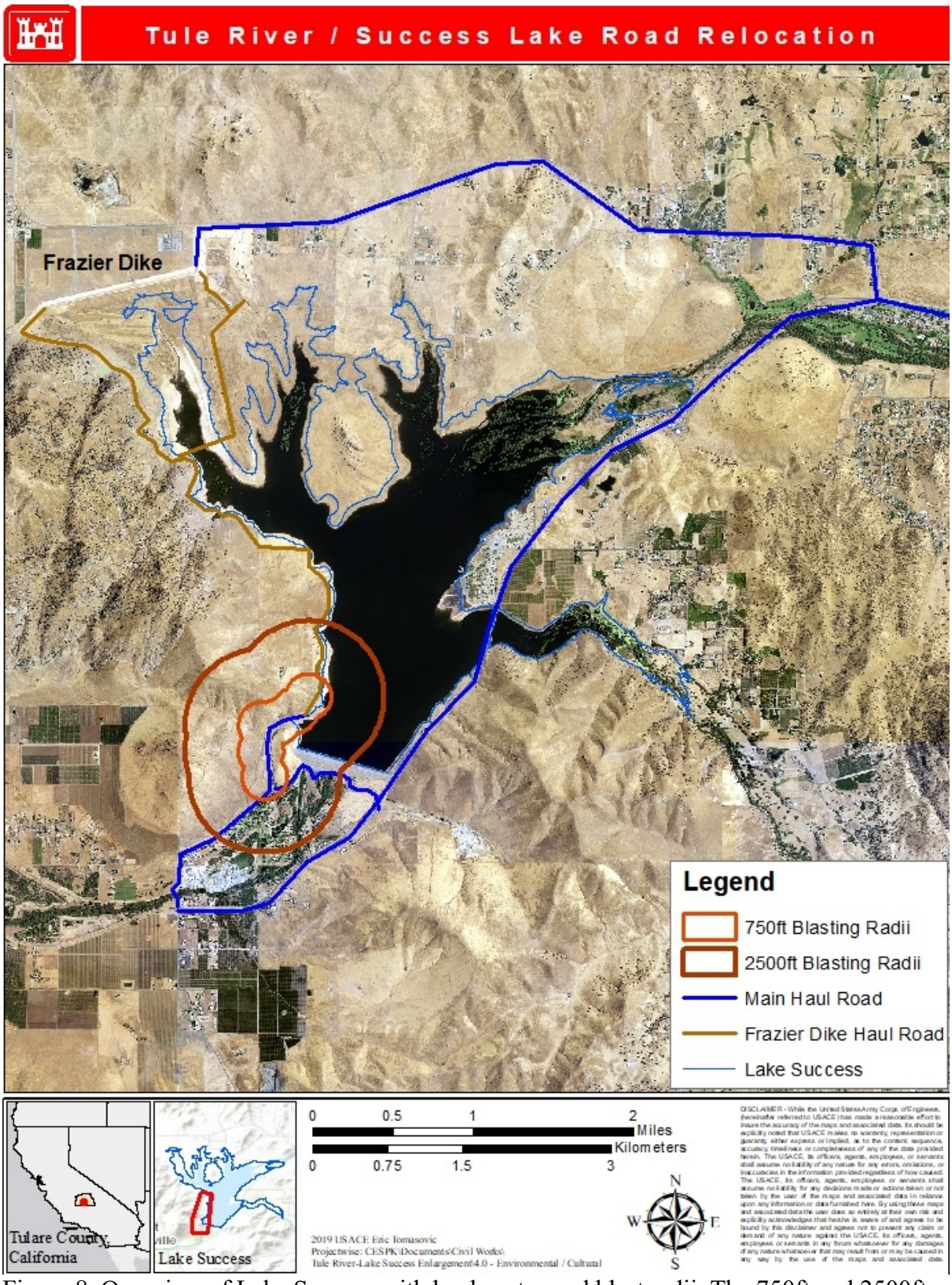

Figure 8. Overview of Lake Success with haul routes and blast radii. The 750ft and 2500ft radii are for safety purposes and do not represent debris fly. Blast debris will typically fly 75-100 feet and will remain within the temporary work area.

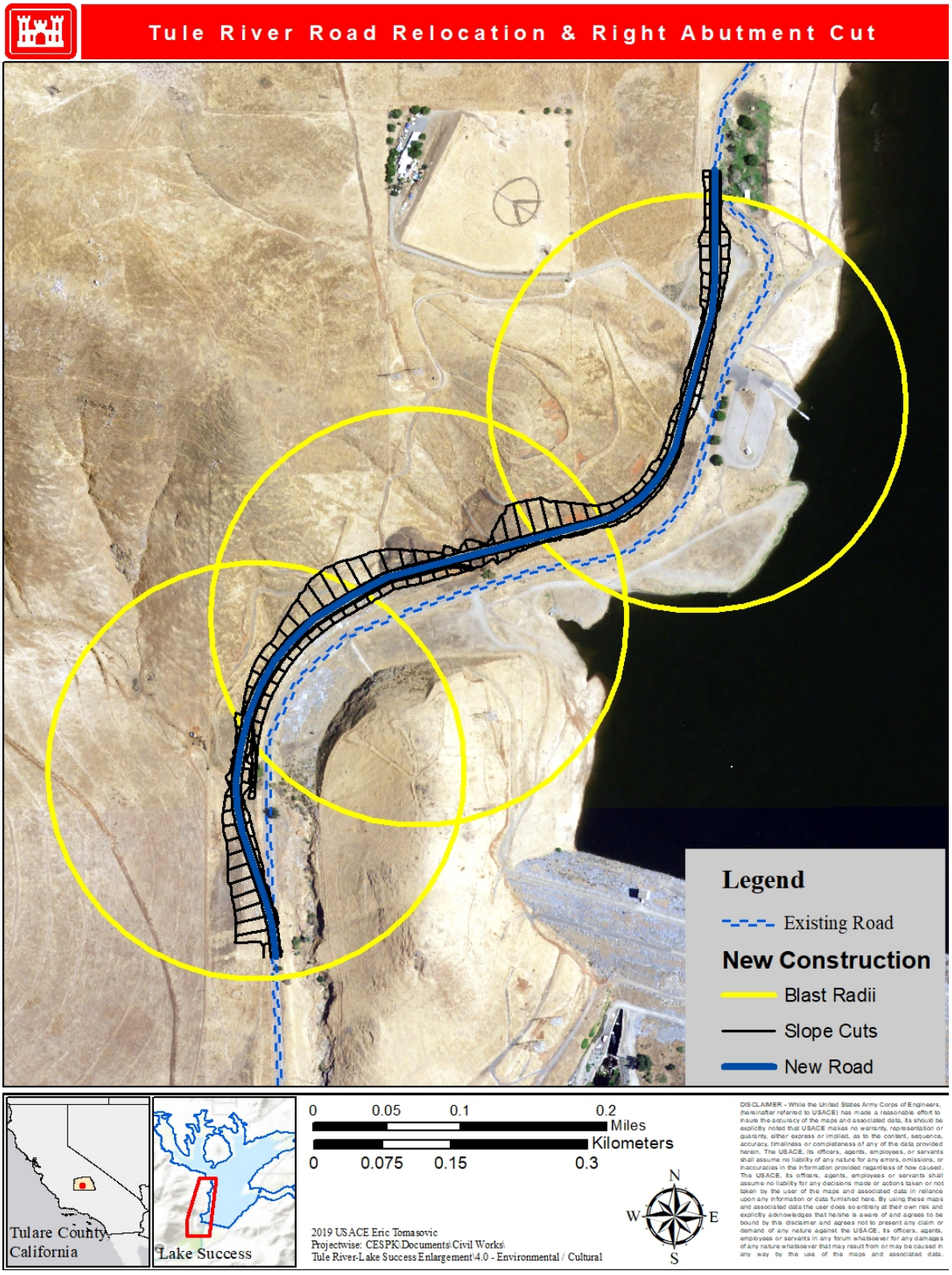

Figure 9. The existing road will be relocated to a new bench along the right abutment of the spillway. The yellow blast radii shown extend 750 feet from the bench and are for safety. Flyrock will not be permitted more than 250 feet from the blastholes along the bend.

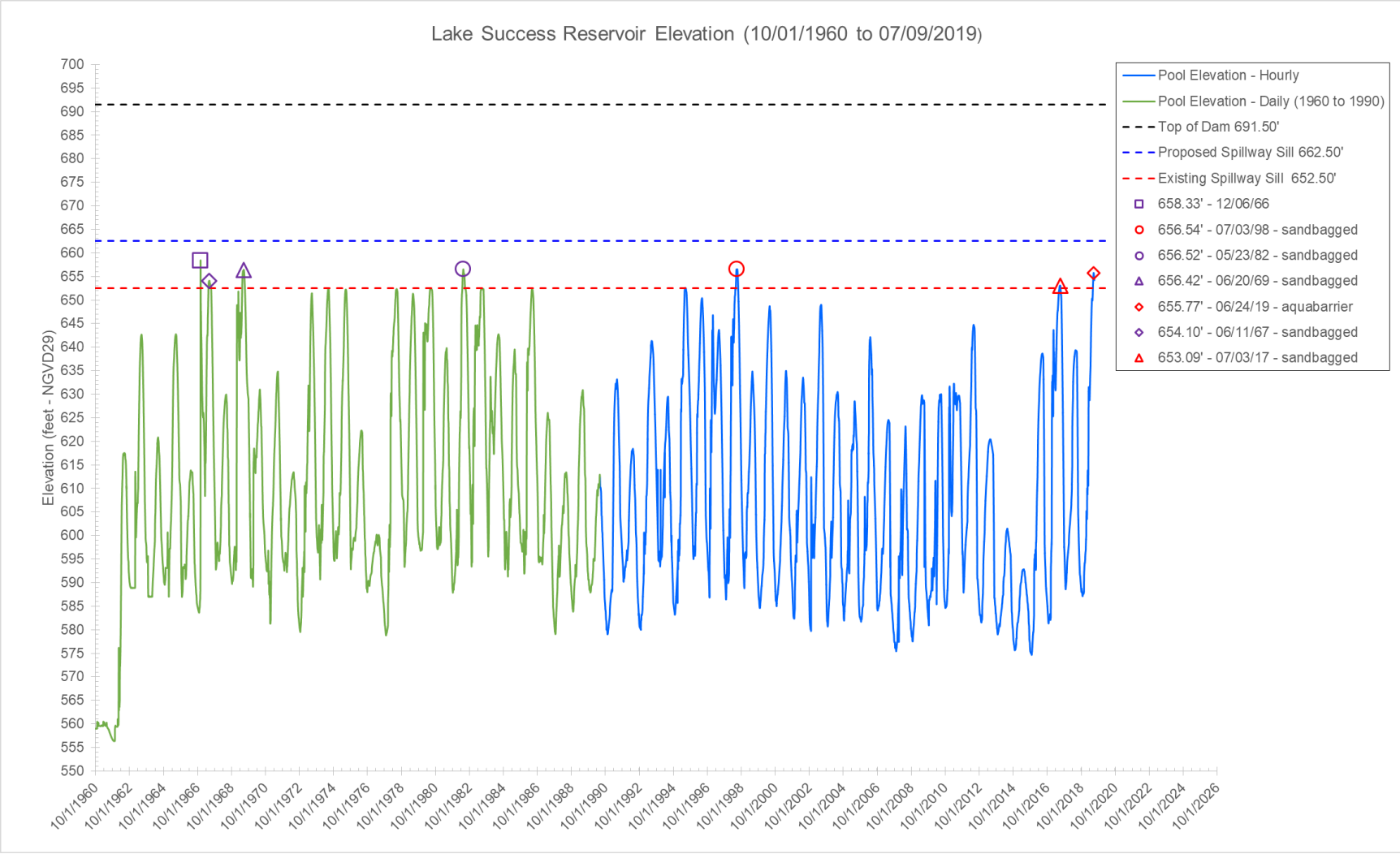

Figure 10. Lake Success reservoir elevation levels over the past 59 years. Red dashed horizontal line represents the current spillway height (652.5 ft), while the blue dashed line represents the proposed spillway height (662.5 ft). After the emergency spillway was first used in December 1966 during flooding, a barrier has been used to prevent high waters from going through the spillway.

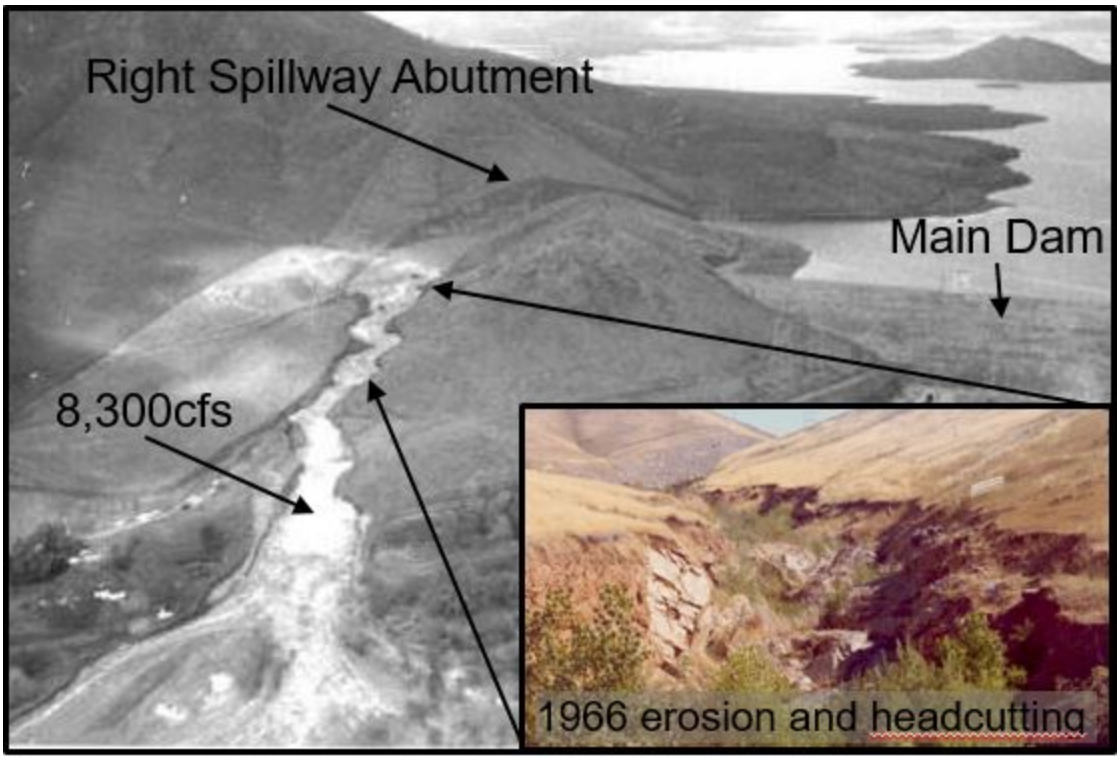

Figure 11. Photo of emergency spillway in December 1966. This was the only time that the spillway has had flowing water. The volume of flow caused erosion and headcutting (see inset) in the lower spillway. Trees started to grow in the newly eroded channel. Since then, the lower spillway has been routinely cleared of vegetation for operations and safety.

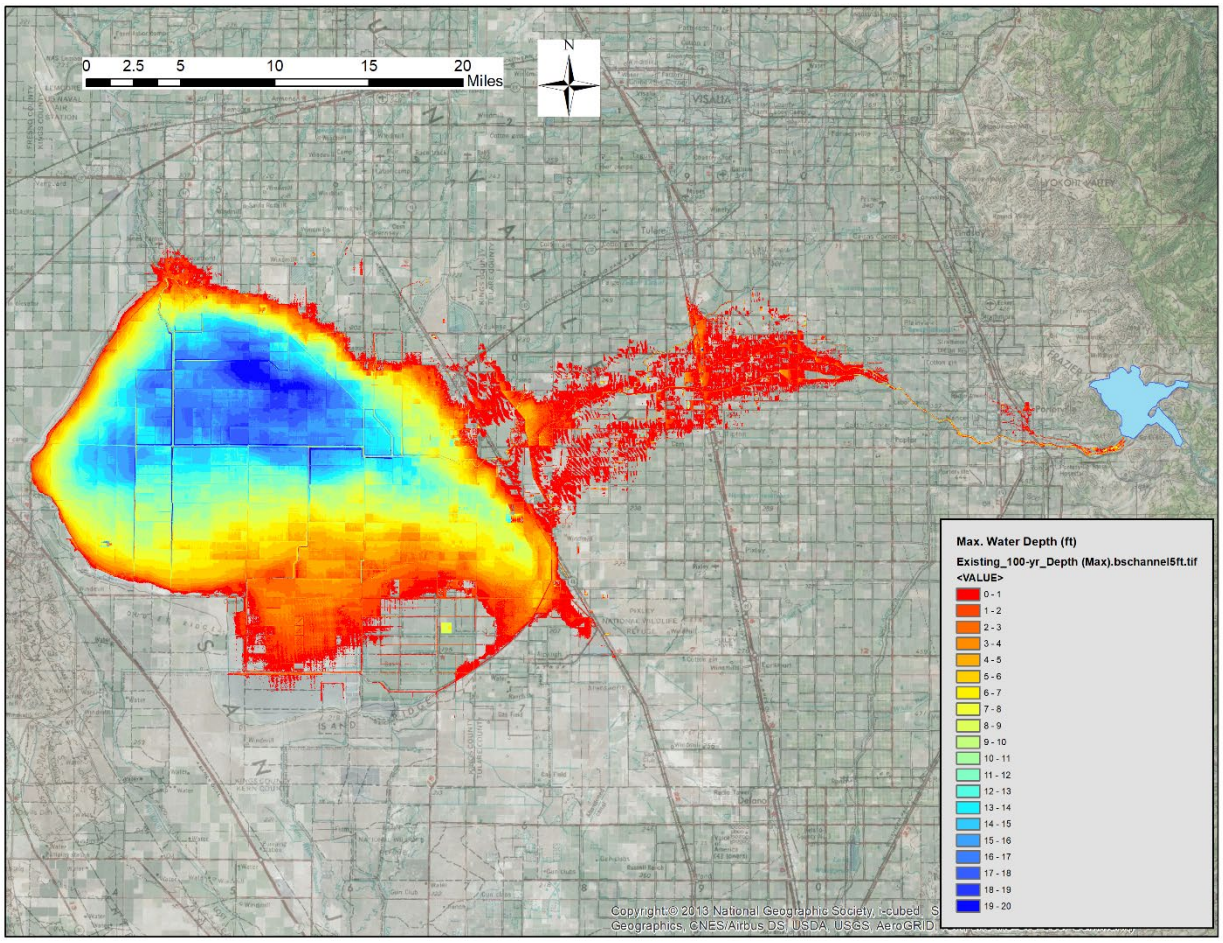

Figure 12. Modeled existing downstream flooding during a 100-year event. Depth in feet. Model based on the physics of water flow (*e.g.*, surface roughness), topography, and hydrology (see Appendix C for details).

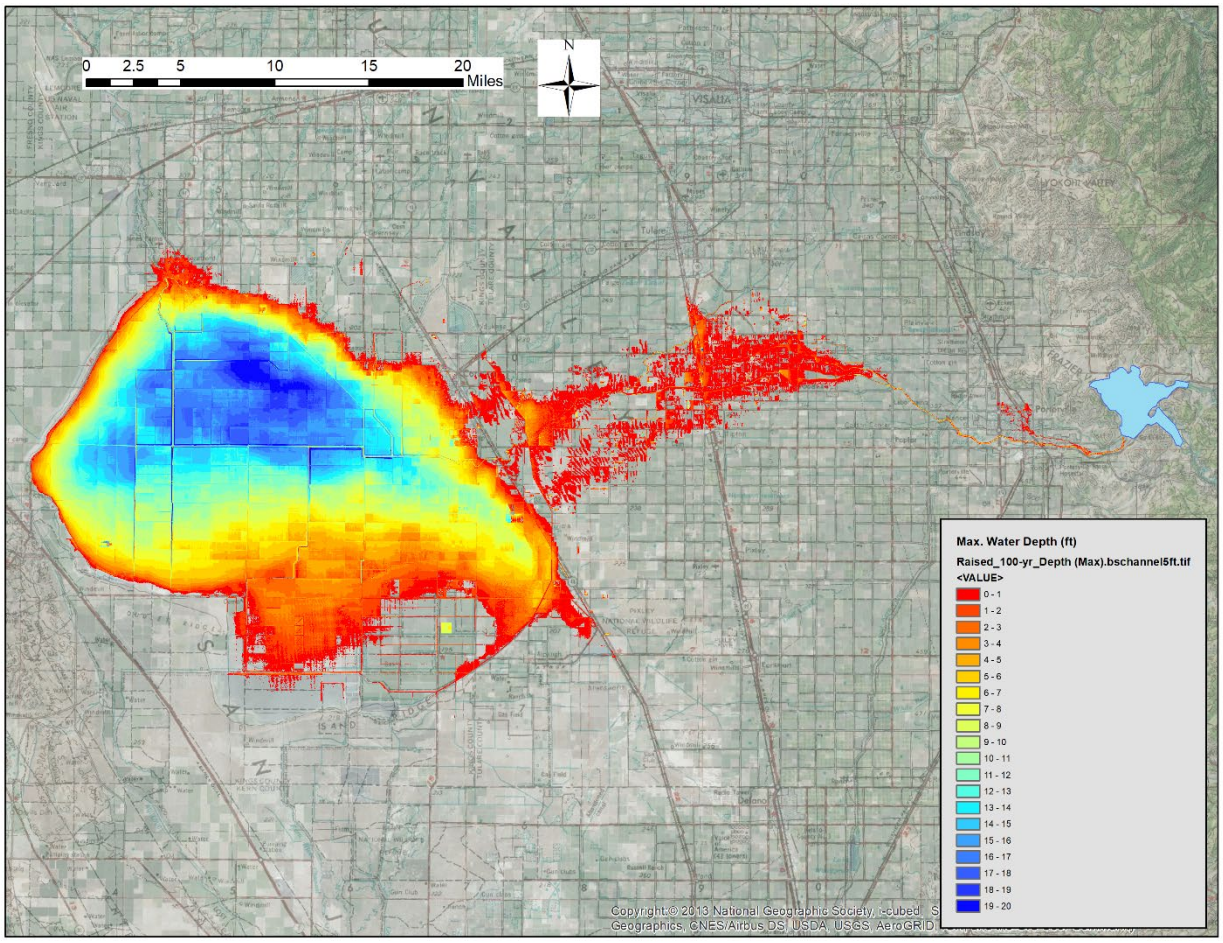

Figure 13. Modeled downstream flooding during a 100-year event after spillway raise. Depth in feet. There is no change in depth or extent of flooding in the Tulare Lakebed. Minor reductions in flooding extent occur in the lower Tule River floodplain over the existing conditions. Greater reductions in flooding extent would occur between the dam and Porterville.

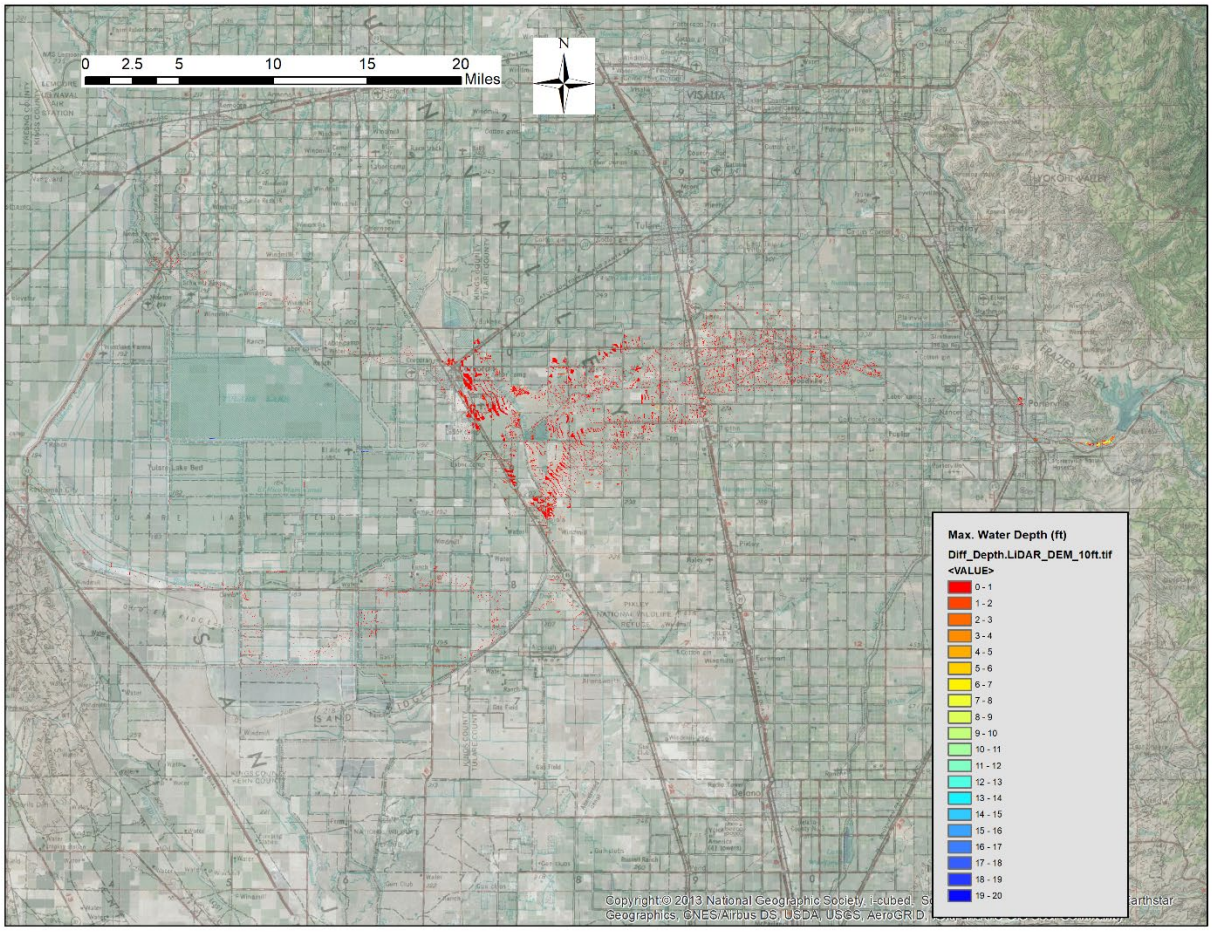

Figure 14. Difference in modeled downstream flooding during a 100-year event. Areas in red and orange are modeled to flood under existing conditions but would not flood after the spillway raise. No difference was observed when comparing existing inundation from 10-year, 20-year, or 50-year floods to inundation after the spillway raise.

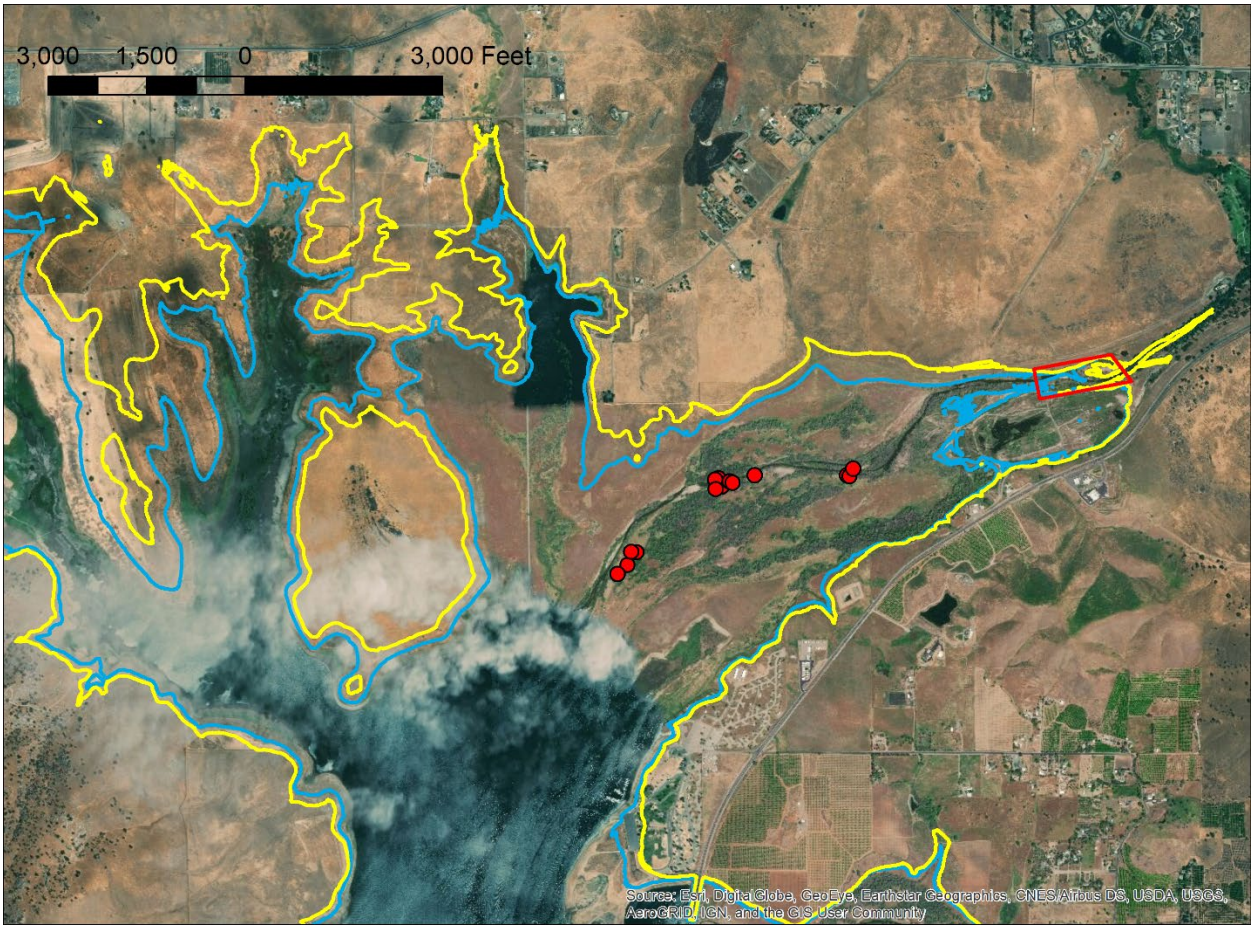

Figure 15. Least Bell's vireo detections (red dots) within the existing gross pool (approximated by the blue line). These detections are from Corps surveys in 2014 along the Tule River and occur within a large expanse of riparian vegetation dominated by willow species, which floods with lake water during most wet years. Based on aerial imagery from 2003-2019, flooding of this area has occurred every year except 2007, 2008, 2012, and 2014. The proposed action would raise the existing gross pool 10 feet (approximated by the yellow line) with potential effects on riparian areas (denoted with red polygon) about 3000 ft from the detections. A detailed map of the area denoted by the red polygon is shown in Figure 20.

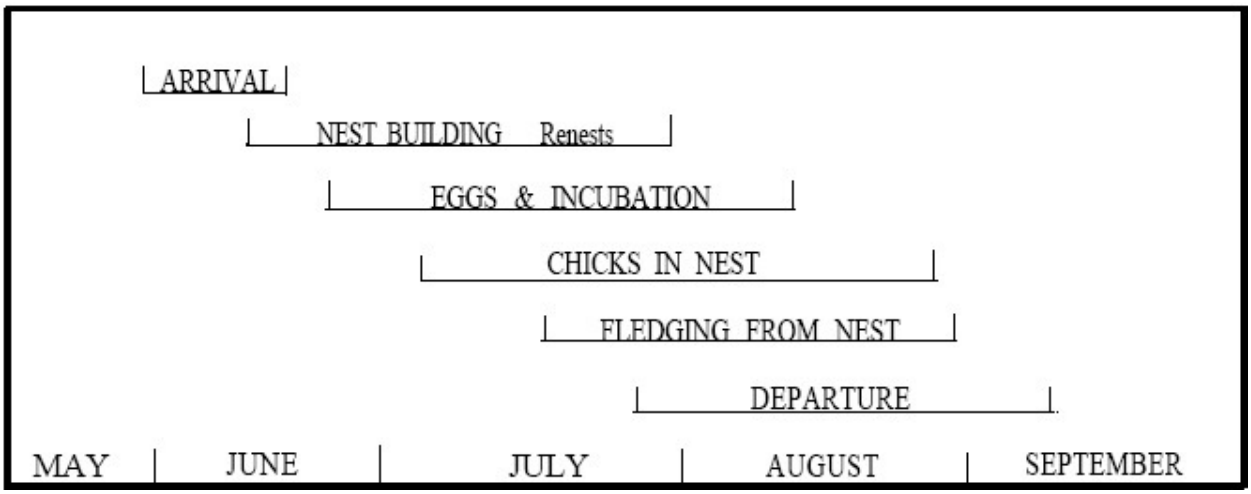

Figure 16. Generalized willow flycatcher breeding chronology for Central and Northern California (adapted from Sogge et al. 1997b).

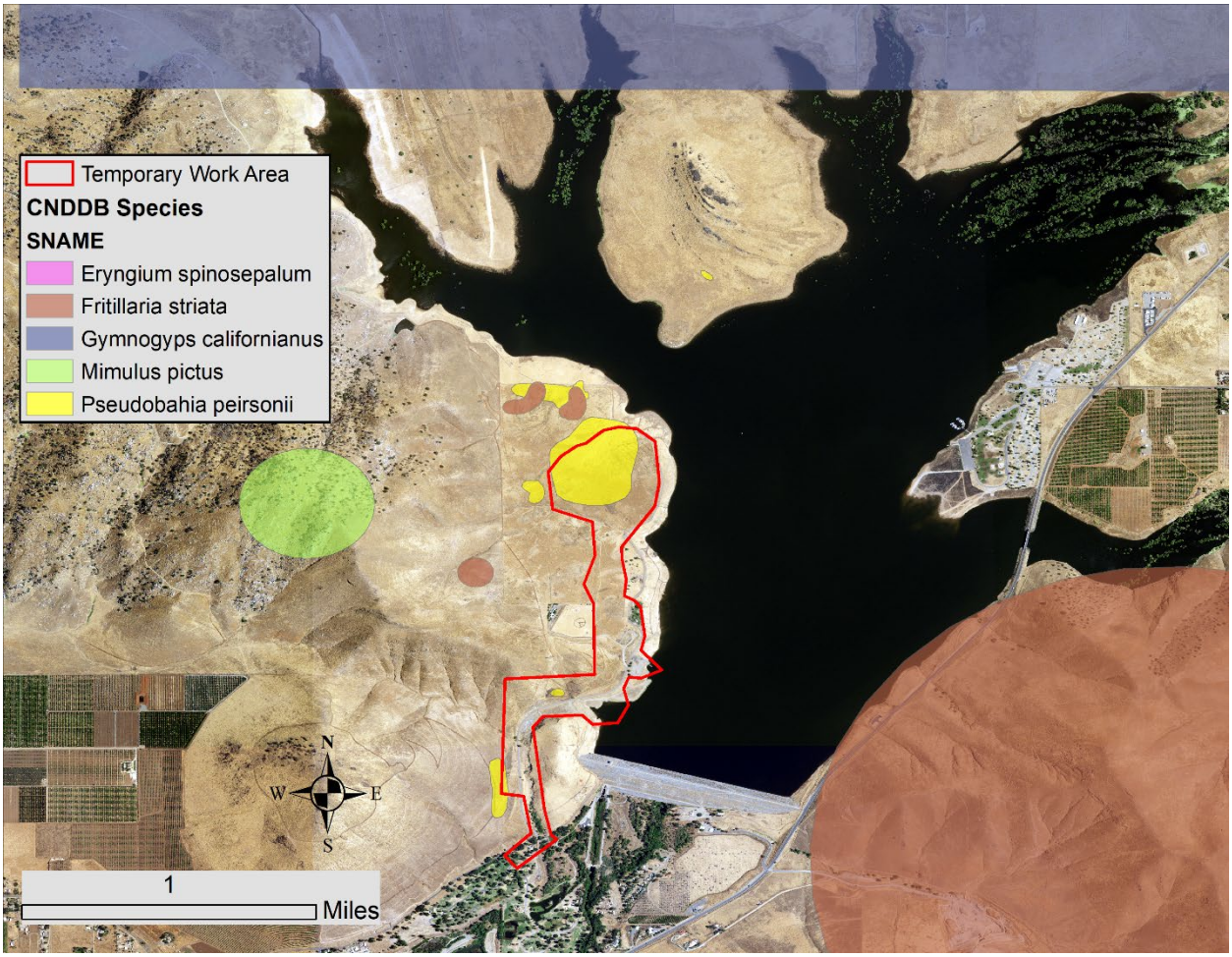

Figure 17. Occurrence of federally-protected species within and near the Phase 1 temporary work area (red outline) from CNDDB (CDFW 2019). The blue polygon for California condor (*Gymnogyps californianus*) represents critical habitat.

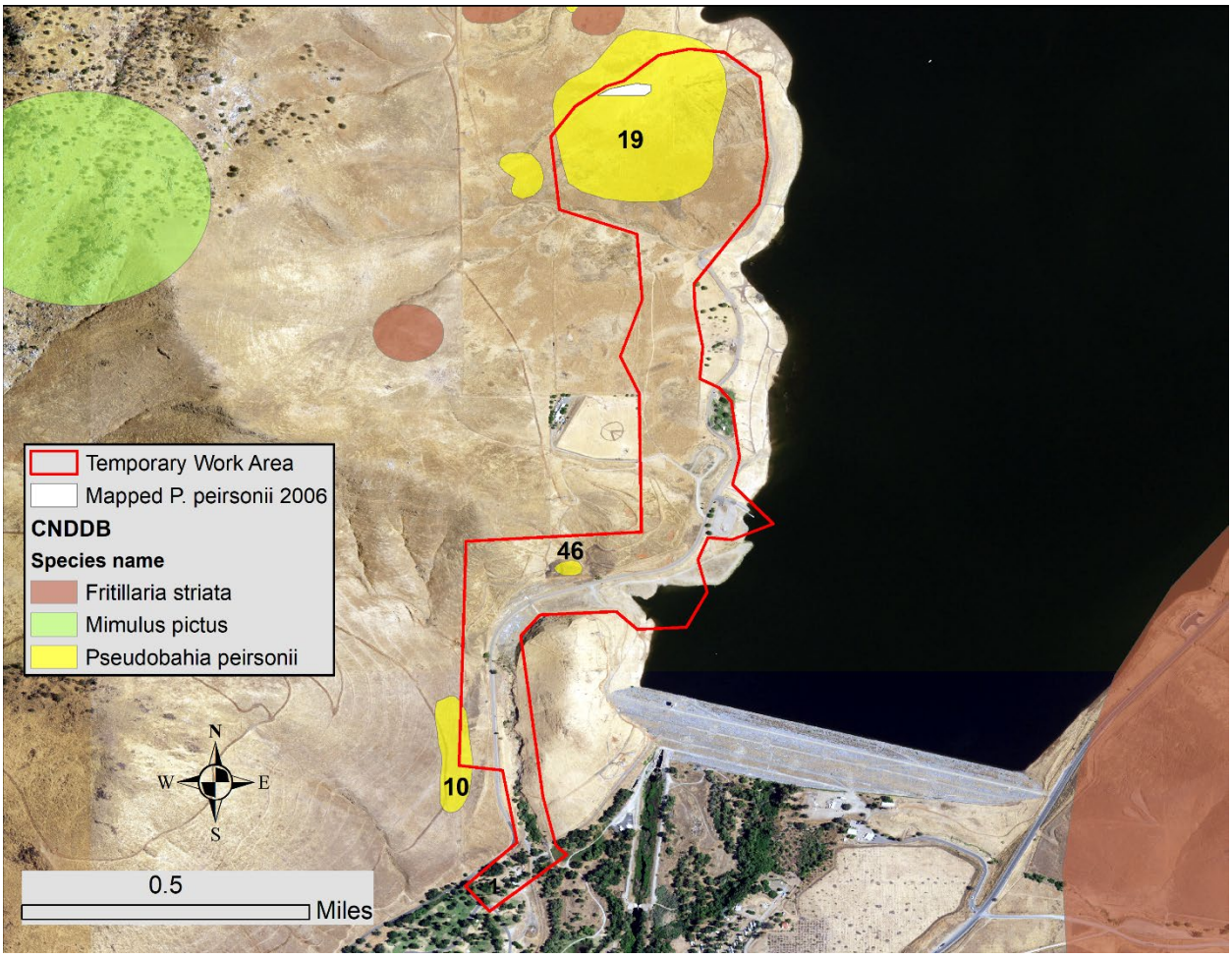

Figure 18. Occurrence numbers from CNDDB for San Joaquin adobe sunburst (*Pseudobahia peirsonii*) (yellow). Boat Island occurrence (#45) not shown since it is outside the Phase 1 temporary work area. This occurrence is visible in Figure 17 as a tiny yellow speck northeast of the project area on Boat Island. Occurrence 19 was more accurately mapped in 2006 with GPS (white polygon).

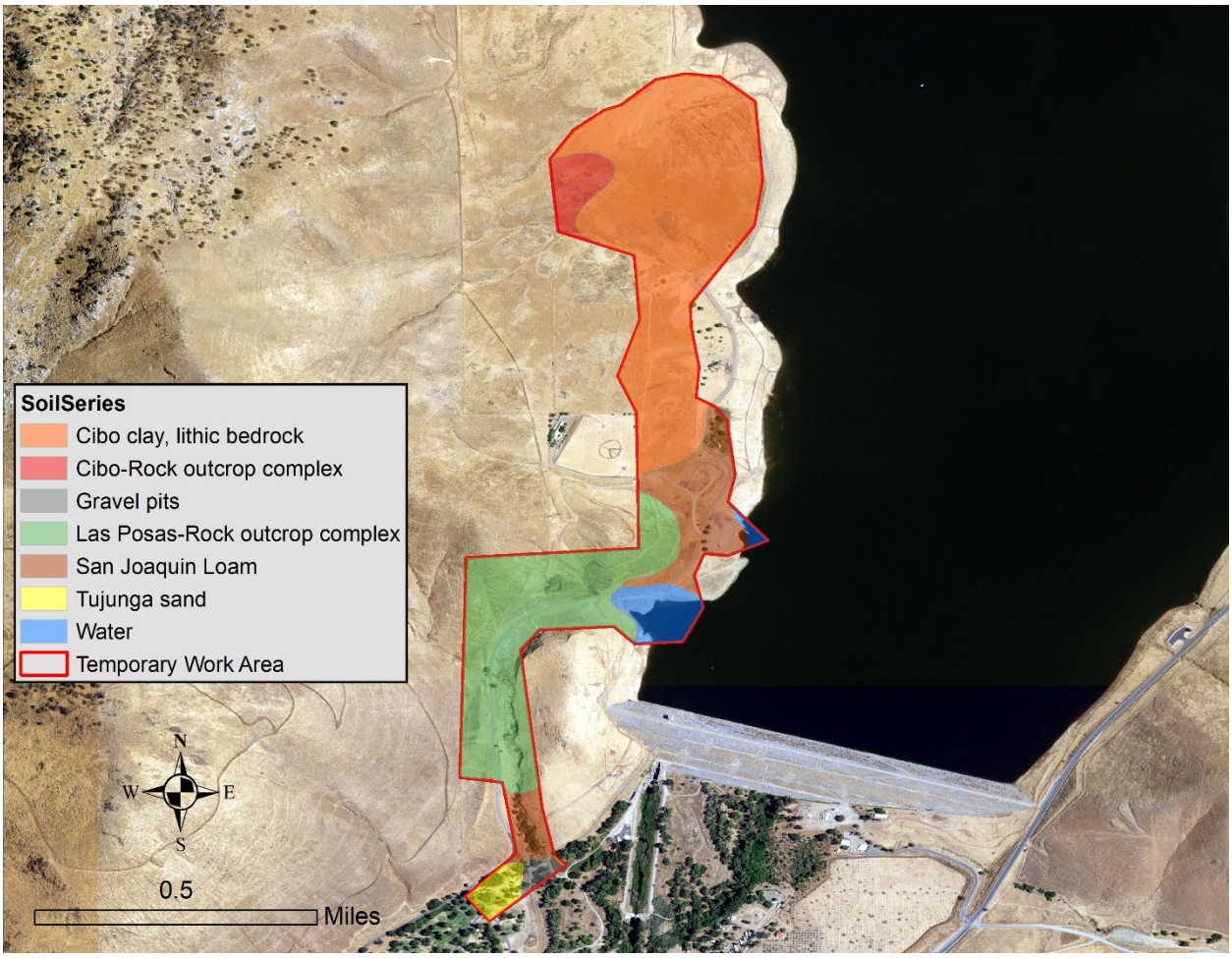

Figure 19. Mapped soil series within the project temporary work area. All soil series, except for Tujunga sand, are shallow to bedrock.

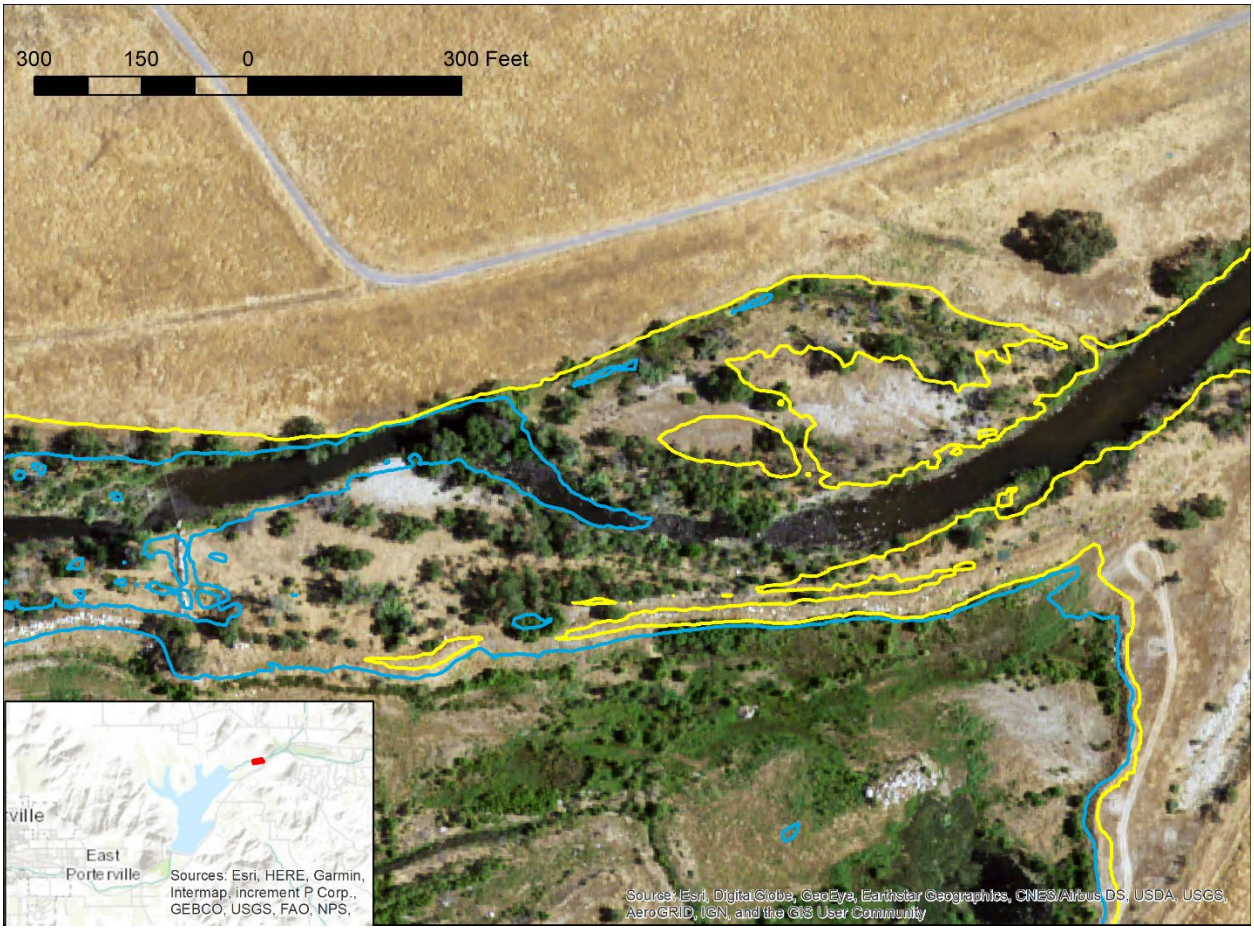

Figure 20. Proposed action would raise the existing potential maximum lake level, approximated by the blue contour line (652.5 ft), ten feet. The proposed potential maximum lake level, approximated by the yellow contour line (662.5 ft), has roughly a one percent chance each year of being flooded from the lake. The effect on existing vegetation is difficult to predict since this section of the Tule River is ungaged and current frequency and duration of flooding of the riparian area from the river is unknown.

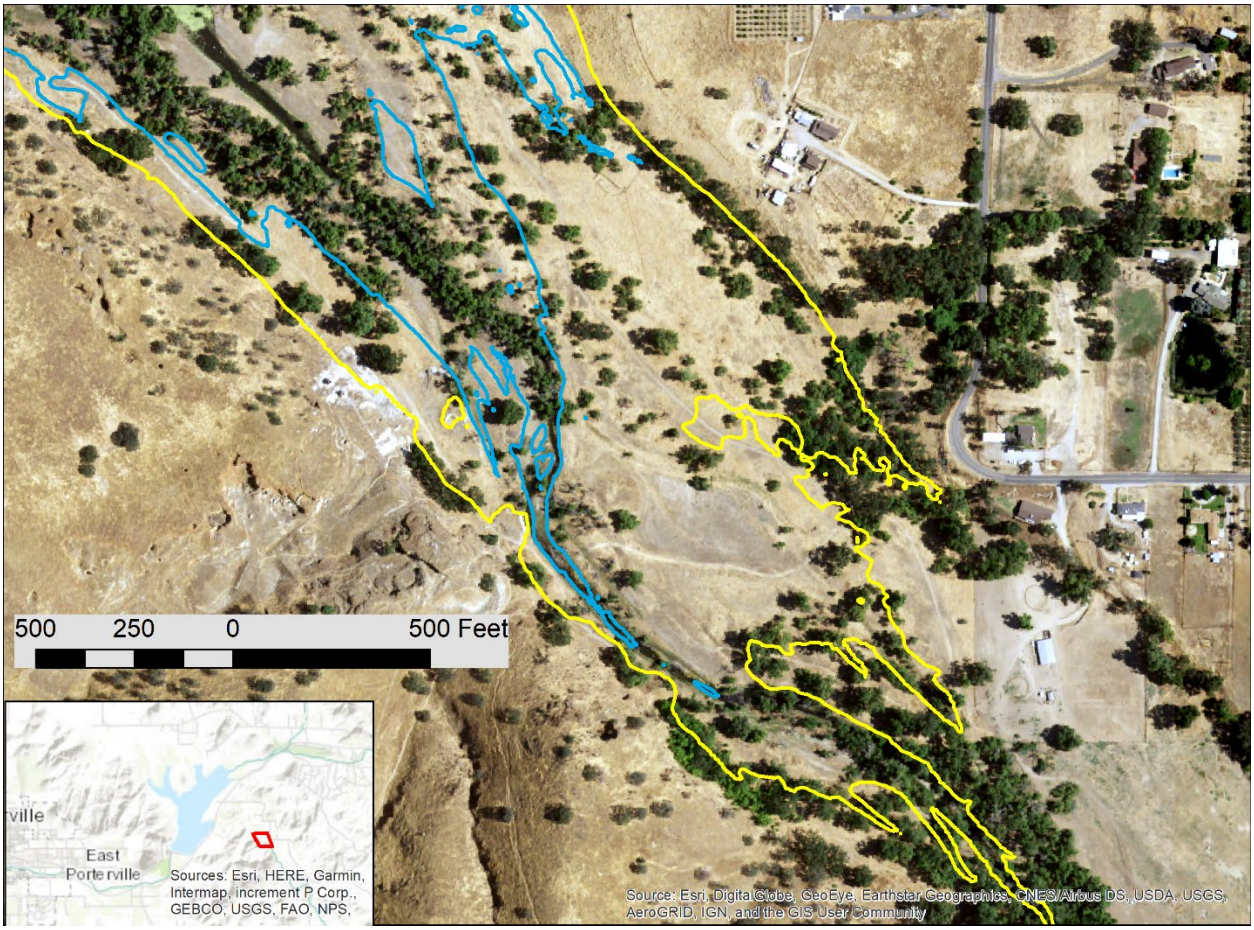

Figure 21. Proposed action would cause a section of the South Fork of the Tule River to periodically flood with lake water. This could increase the amount of riparian vegetation.

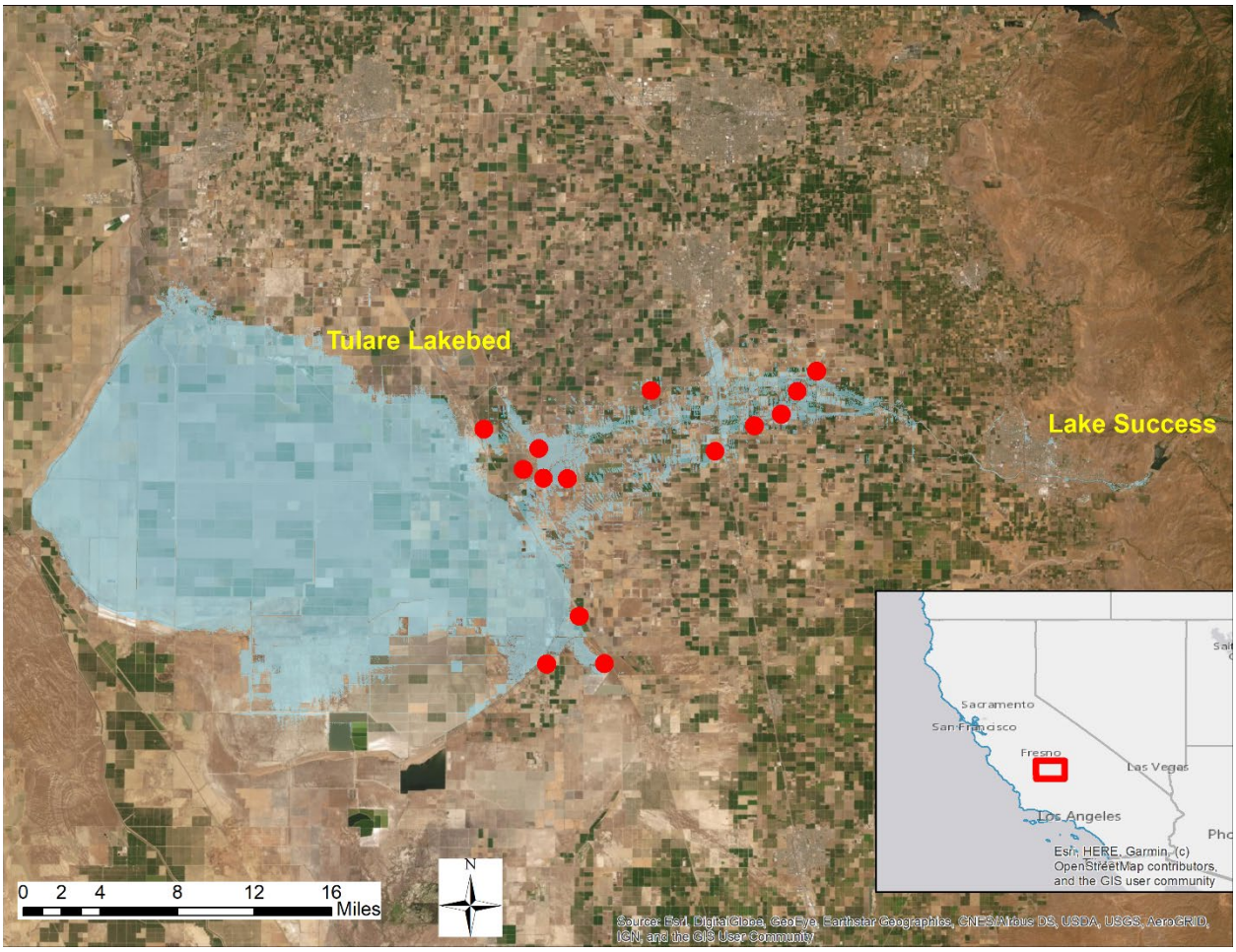

Figure 22. Occurrence of kit fox within and adjacent to the lower Tule River floodplain and Tulare Lakebed. All occurrences within the lower Tule River floodplain are from the early 1970s. One occurrence (third from the bottom of the map) is from 2002.

Table 1. Summary of effects from the proposed project (both Phase 1 and 2) to Federally endangered and threatened species.

Evolutionarily Significant Unit (ESU) / Distinct Population Segment (DPS) / Other	Listing Status	Resource Agency Jurisdiction	Critical Habitat Designation/ Action Area within Designated Critical Habitat (DHC)	Magnuson-Stevens Act Essential Fish Habitat / Effects Determination	Factors Affecting Determination	ESA Section 7 Effects Determination
Mammals						
San Joaquin Kit Fox (*Vulpes macrotis mutica*)	Endangered (March 11, 1967: 32 FR 4001)	USFWS	None Designated	N/A	The project actions may result in short term avoidance by foraging kit fox due to construction and blasting. However, the proposed action area is marginal habitat for kit fox and impacts are likely to be less than significant.	May affect, is likely to adversely affect
Birds						
California Condor (*Gymnogyps californianus*)	Endangered (March 11, 1967: 32 FR 4001)	USFWS	Outside DCH	N/A	Regional shrubland, coniferous forest, and oak savanna vegetation growth would remain consistent with baseline conditions. Therefore available habitat would not be diminished.	No Effect
Least Bell's Vireo (*Vireo bellii pusillus*)	Endangered (May 2, 1986: 51 FR 16474)	USFWS	Outside DCH	N/A	Local riparian vegetation growth would remain consistent with baseline conditions. Therefore available habitat would not be diminished.	May affect, but is not likely to adversely affect
Southwestern Willow Flycatcher (*Empidonax traillii extimus*)	Endangered (February 27, 1995: 60 FR 10694)	USFWS	Outside DCH	N/A	Local riparian vegetation growth would remain consistent with baseline conditions. Therefore available habitat would not be diminished.	May affect, but is not likely to adversely affect
Reptiles						
Blunt-nosed Leopard Lizard (*Gambelia silus*)	Endangered (March 11, 1967: 32 FR 4001)	USFWS	None Designated	N/A	Regional grassland and shrubland vegetation growth would remain consistent with baseline conditions. Therefore available habitat would not be diminished. Species is not known to currently occur east of Hwy 99 in Tulare County, which is more than 20 miles west of the proposed action.	No Effect
Giant Garter Snake (*Thamnophis gigas*)	Threatened (October 20, 1993: 58 FR 54053)	USFWS	Outside DCH	N/A	Based on the USFWS Final GGS Recovery Plan, the species is not currently found downstream from Lake Success along the Tule River, or anywhere else in Tulare County (USFWS 2017). Therefore, available habitat would not be diminished.	No Effect
Amphibians						

Evolutionarily Significant Unit (ESU) / Distinct Population Segment (DPS) / Other	Listing Status	Resource Agency Jurisdiction	Critical Habitat Designation/ Action Area within Designated Critical Habitat (DHC)	Magnuson-Stevens Act Essential Fish Habitat / Effects Determination	Factors Affecting Determination	ESA Section 7 Effects Determination
California Red-legged Frog (*Rana draytonii*)	Threatened (May 23, 1996: 61 FR 25813-25833)	USFWS	Outside DCH	N/A	Local riparian vegetation growth would remain consistent with baseline conditions. Therefore available habitat would not be diminished.	No Effect
Insects						
Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*)	Threatened (August 8, 1980: 45 FR 52803-52807)	USFWS	Outside DCH	N/A	Proposed action is >85 miles away from current species range (USFWS 2019). Regional riparian vegetation growth would not differ substantially from baseline conditions. Available habitat would not be significantly diminished.	No Effect
Fishes						
Delta Smelt (*Hypomesus transpacificus*)	Threatened (March 5, 1993: 58 FR 12854-12864)	USFWS	Outside DCH	N/A	Lake Success and the Tule River are outside the habitat range for this species.	No Effect
Flowering Plants						
Keck's Checker-mallow (*Sidalcea keckii*)	Endangered (February 16, 2000: 65 FR 7757-7764)	USFWS	Outside DCH	N/A	Local blue oak woodland growth would not differ substantially from baseline conditions. Available habitat would not be significantly diminished. Only known occurrence of this species within the "Success Dam" quad was extirpated in 2002 (CDFW 2019).	No Effect
San Joaquin Adobe Sunburst (*Pseudobahia peirsonii*)	Threatened (February 6, 1997: 62 FR 5542-5551)	USFWS	None Designated	N/A	Two occurrences of this species are within the project area footprint. Field surveys by a trained USACE botanist in 2019 determined that the species is not currently present. However, this action would directly, adversely affect known habitat.	May affect, is likely to adversely affect
Springville Clarkia (*Clarkia springvillensis*)	Threatened (September 14, 1998: 63 FR 49022-49035)	USFWS	None Designated	N/A	Both occurrences of this species at Success Lake listed on CNDDB are erroneous. These occurrences came from Corps surveys in 2006. Dr. Frank Vasek, the botanist who originally described the species, verified in 2008 that the collected specimens were actually an atypical outcrossing form of Kern River clarkia (*Clarkia exilis*) (Unger and Beyerl 2008)	No Effect

Table 2. San Joaquin adobe sunburst plant counts by CNDDB occurrence/location and survey year. See Figure 10 for general location of occurrences. 1991 = Stebbins, 2006 = Unger and Beyerl, 2010 = Vollmar Consulting (CDFW 2019), and 2014-2019 = Corps surveys (documented in written, internal reports).

CNDDB No.	Location	1991	2006	2010	2014	2016	2017	2019
10	Ave 146	45	N/S	40	0	10	0	0
19	Rocky Hill	200	30	0	0	0	0	0
45	Boat Isl.	N/S	45	0	0	N/S	N/S	0
46	Spillway	N/S	120	0	21	N/S	0	0

N/S = not surveyed that year

APPENDIX B - CULTURAL RESOURCE COORDINATION

PROGRAMMATIC AGREEMENT
BETWEEN
THE U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT
AND
THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER
REGARDING
THE TULE RIVER SPILLWAY ENLARGEMENT PROJECT

WHEREAS, the U.S. Army Corps of Engineers, Sacramento District (Corps), owns and operates Success Dam, a zoned earth-filled dam that impounds the Tule River about 5 miles east and upstream of the city of Porterville in Tulare County, California, which was authorized for construction by the Flood Control Act of 1944 (Public Law [PL] 534, 22 December 1944, Seventy-eighth Congress, Second Session); and

WHEREAS, in 1999, the Tule River Basin Investigation Final Feasibility Report and Chief's Report recommended increasing storage in Success Dam Reservoir for flood risk management and irrigation water supply by raising the spillway by 10 feet; and

WHEREAS, Congress authorized construction of a project to raise the Success Dam spillway and increase reservoir storage through the Water Resources Development Act (WRDA) of 1999 Section 101(b)(4) (PL 106-53, 17 August 1999) and provided funding for the Tule River Spillway Enlargement Project (Project) as a Civil Works Flood Control and Coastal Emergencies project through Supplemental Appropriations under PL 115-123, Division B, Subdivision 1—Further Additional Supplemental Appropriations for Disaster Relief Requirements Act, 2018; and

WHEREAS, the Project authorized and funded by Congress would increase the storage capacity of Success Dam Reservoir through a phased construction project that would widen the existing spillway from 200 to 365 feet, raise its height by 10 feet through construction of an ogee weir, and raise the maximum gross reservoir pool from 652.5 feet above mean sea level (amsl) to 662.5 feet amsl; and

WHEREAS, the Corps has determined that the Project constitutes an undertaking, as defined in 36 CFR § 800.16(y), and is therefore subject to the requirements of 54 USC § 306108, commonly known as Section 106 of the National Historic Preservation Act (NHPA), as amended; and

WHEREAS, the Corps determined that Success Dam is not eligible for inclusion on the National Register of Historic Places (NRHP) under any criteria, and received California State Historic Preservation Officer (SHPO) consensus regarding this determination through correspondence dated November 5, 2019; and

WHEREAS, the Corps determined that although Success Dam is not eligible for the NRHP, the undertaking involves the type of activity that has the potential to cause effects on historic properties, assuming such properties are present, and that the phased nature of the Project requires phasing of the Section 106 process to identify and evaluate historic properties as described at 36 CFR § 800.4 – § 800.5, and to resolve adverse effects on historic properties if necessary in accordance with 36 CFR § 800.6, which requires execution of a Programmatic Agreement (PA) pursuant to 36 CFR § 800.14(b)(1)(ii); and

WHEREAS, the Corps is complying with Section 106 of the NHPA for this Project through the execution and implementation of this PA, pursuant to 36 CFR § 800.14(b)(1)(iii), because the Corps cannot fully determine the effects of the undertaking on historic properties for all phases of the Project prior to the approval of the expenditure of Federal funds on the undertaking; and

WHEREAS, the Corps has consulted with the California State Historic Preservation Officer (SHPO) on the development of this PA for phasing the Section 106 process for the undertaking; and

WHEREAS, the Corps has invited the Lower Tule River Irrigation District, the non-Federal sponsor for the Project, to be a Concurring Party to this PA; and

WHEREAS, the California Native American Heritage Commission (NAHC) has identified the Tule River Indian Tribe, Santa Rosa Rancheria Tachi Yokut Tribe, Kern Valley Indian Community, Tubatulabals of Kern Valley, and the Wuksache Indian Tribe/Eshom Valley Band as having cultural resources interests in the Project area and the Corps has invited these Indian tribes and Native American interested parties to participate as Section 106 consulting parties regarding the undertaking and as Concurring Parties to this PA; and

WHEREAS, in accordance with 36 CFR § 36 CFR § 800.6(a)(1), through correspondence dated June 18, 2019, the Corps notified the Advisory Council on Historic Preservation (ACHP) of the development of this PA and through correspondence dated July 31, 2019, the ACHP declined to participate in its development; and

WHEREAS, in accordance with 36 CFR § 800.6(a)(4) and 36 CFR § 800.14(b)(2)(ii), the Corps has notified the public of the Project of the development of this PA and provided an opportunity for members of the public to comment on the Project and the Section 106 process for the undertaking; and

WHEREAS, the definitions set forth in 36 CFR § 800.16, the definitions for Signatory Parties set forth in 36 CFR § 800.6(c)(1), and the definitions for Concurring Parties set forth in 36 CFR § 800.6(c)(3), are incorporated herein by reference and apply throughout this PA; and

NOW, THEREFORE, the Signatories agree that the undertaking shall be implemented in accordance with the following stipulations in order to take into account the effects of the undertaking on historic properties.

I. TIME FRAMES AND REVIEW PROCEDURES

A. For any document or deliverable produced in accordance with the stipulations of this PA, the Corps shall provide a draft version to the SHPO, Concurring Parties, and/or Indian tribes or other Native American interested parties for review. To the extent feasible, the Corps will provide draft documents and deliverables to reviewers by hard copy and electronically, by email or other means, if so requested by a reviewer. Any written comments provided to the Corps by hard copy or electronically or within thirty (30) calendar days after the date of receipt by the reviewing party shall be considered in the revision of the document or deliverable.

B. The Corps shall keep a record of the written comments received for all draft documents or deliverables and how those comments were addressed. The Corps shall provide electronic and hard copies of revised final documents or deliverables to the SHPO for concurrence. The SHPO shall have thirty (30) calendar days from the date of receipt to accept or concur with the document or deliverable.

C. Failure of the SHPO, Concurring Parties, and Indian tribes or other Native American interested parties to respond within thirty (30) calendar days of any submittal shall not preclude the Corps from moving forward with the undertaking or next steps in this PA.

D. Should the SHPO object to a final document or deliverable submitted for concurrence, the Corps and SHPO shall consult regarding the objection as outlined in Stipulation XIV (Dispute Resolution).

II. AREA OF POTENTIAL EFFECTS

A. Current planning, design, engineering and funding requirements necessitate multiple Project phases. The first phase of the Project will consist of the right abutment spillway cut; the realignment of a segment of Worth Drive/Avenue 146, a road currently aligned down the invert of the existing spillway; and stockpiling of materials removed through these activities. Subsequent Project phases include the left abutment spillway cut and spillway raise (i.e., ogee weir construction within the enlarged spillway); land acquisitions; utility relocations; armoring of the Highway 190 bridge and Frazier Dike, to prevent impacts from a higher gross reservoir pool; and changes in the water control diagram associated with managing increased reservoir capacity. The reservoir pool raise itself would occur intermittently after the completion of Project construction.

B. The overall Project APE, as documented in Appendix A to this PA, consists of the following:

1. The extent of all Project construction activities required to enlarge and raise the spillway and increase the gross reservoir pool; and

2. All construction staging areas, access routes, borrow areas, spoil areas, and stockpiling areas; and

3. Any additional rights-of-way or easements obtained by the Corps or local partner as required for Project construction; and

4. Other areas that may be impacted by Project-related activities, including downstream areas that may be affected by changes in reservoir operations; areas associated with habitat restoration or environmental mitigation measures; and/or other areas potentially affected by Project construction.

C. As a Project phase approaches final design, the Corps will prepare and consult with the SHPO, Concurring Parties, and Indian tribes or other Native American interested parties on a refined APE specific to that Project phase. Consultation time frames and review procedures for consultation on a refined APE will follow those described in Stipulation I (Time Frames and Review Procedures).

D. If changes in Project design necessitate modifying an APE previously subject to review under this PA, the Corps will submit a modified APE to the SHPO, Concurring Parties, and Indian tribes or other Native American interested parties. Time frames and review procedures for consultation on a modified APE will follow those described in Stipulation I (Time Frames and Review Procedures). Any objections or disputes related to documentation of the Project APE or modified APE will be handled as described in Stipulation XIV (Dispute Resolution).

E. The APE for specific Project phases, or for the Project as a whole, may be refined as described herein without requiring amendment to this PA.

F. As necessary to meet Project schedules, the Corps may address multiple steps in 36 CFR §§ 800.4 through 800.6 as provided for at 36 CFR § 800.3(g).

III. IDENTIFICATION AND EVALUATION OF HISTORIC PROPERTIES

A. To the extent feasible under Project schedule constraints, the Corps shall identify and evaluate historic properties in the APE through the process described at 36 CFR § 800.4. In the event that evaluation is not feasible, the Corps may elect to treat identified cultural resources as eligible for inclusion in the NRHP for the purposes of this undertaking. Based on Project schedule and access, the Corps may phase these identification and evaluation efforts pursuant to 36 CFR § 800.4(b)(2).

B. The Corps shall consult on the results of identification and evaluation efforts for each Project phase in accordance with the timeframes and procedures described in Stipulation I (Time Frames and Review Procedures).

C. As necessary to meet Project schedules, the Corps may address multiple steps in 36 CFR §§ 800.4 through 800.6 in a single consultation, as provided for at 36 CFR § 800.3(g).

IV. ASSESSMENT AND RESOLUTION OF ADVERSE EFFECTS

A. The Corps will apply the criteria of adverse effect to historic properties identified within the APE, refined APE, or modified APE pursuant to 36 CFR § 800.5(a)(1). Based on Project schedule and access, the Corps may use a phased process in applying the criteria of adverse effect consistent with phased identification and evaluation efforts pursuant to 36 CFR § 800.5(a)(3).

1. Avoidance of adverse effects to historic properties is the preferred treatment approach. If feasible, the Corps will consider redesign of Project elements in order to avoid historic properties and adverse effects; however, given Project constraints, avoidance through redesign may not be possible.

2. If an adverse effect to a historic property cannot be avoided, the Corps will resolve the adverse effect(s) through implementation of measures identified in a Project Historic Properties Treatment Plan (HPTP) as described in Stipulation VI (Historic Properties Treatment Plan).

V. HISTORIC PROPERTIES TREATMENT PLAN

A. The Corps, in consultation with the SHPO, Concurring Parties, and Indian tribes or other Native American interested parties and/or any additional consulting parties, shall develop and implement a HPTP for the Project that describes the actions the Corps will take to avoid, minimize, and/or resolve any adverse effect(s) resulting from the undertaking (or phase of the undertaking).

1. Resolution of adverse effects to archaeological properties through means other than data recovery may be considered when developing the HPTP (e.g., detailed architectural recordation, oral history documentation, development of interpretive materials or publications, or other mitigation means, as agreed upon by the Corps and the SHPO). If data recovery is determined to be the most appropriate method of treatment, the Corps shall ensure that the recovery methods and documentation adhere to the *Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation.*

2. The Corps shall be responsible for consulting on the appropriate means of mitigation with the SHPO, Concurring Parties, and Indian tribes or other Native American interested parties and/or any additional consulting parties concerned with the effect of the Project on historic properties.

3. The Corps will submit all documentation related to HPTP implementation for review as described in Stipulation I (Timeframes and Review Procedures). Any objections or disputes related to HPTP implementation will be handled as described in Stipulation XIV (Dispute Resolution).

VI. POST-REVIEW DISCOVERIES

A. If historic properties are discovered, or unanticipated effects on historic properties are found, during any phase of Project construction, the Corps will follow the procedures at 36 CFR § 800.13.

1. The Project HPTP, prepared in consultation with the SHPO, Concurring Parties, Indian tribes, other Native American interested parties, and/or other consulting parties, shall include a plan for responding to such discoveries pursuant to 36 CFR § 800.13(a)(2).

VII. TREATMENT OF NATIVE AMERICAN HUMAN REMAINS

A. It is possible that human remains may be discovered during Project construction or during archaeological excavations associated with identification, evaluation, or data recovery efforts associated with the undertaking.

B. If Native American human remains, associated funerary objects, unassociated funerary objects, sacred objects, and/or objects of cultural patrimony are inadvertently discovered or intentionally excavated on Federal lands, the Corps will follow the procedures outlined in the Native American Graves Protection and Repatriation Act (NAGPRA), as specified in the implementing regulations at 43 CFR § 10.2(d)(1-2). The Corps will ensure that all such NAGPRA cultural items encountered on Federal lands during any activity associated with the undertaking are treated in accordance with Section 3(c-d) of NAGPRA and the implementing regulations at 43 CFR Part 10.

C. For Native American burials, skeletal remains, and associated grave goods discovered or intentionally excavated on non-Federal land during any activity associated with the undertaking, the treatment and disposition of the remains will follow the requirements of Section 7050.5 of the California State Health and Human Safety Code and Section 5097.98 of the California Public Resources Code.

D. Any HPTP developed under this PA also may include an Inadvertent Discovery and Burial Treatment Plan specific to the actions specified in the HPTP, as needed.

VIII. CURATION OF ARCHAEOLOGICAL COLLECTIONS

A. The Corps will ensure that any non-NAGPRA related cultural materials and associated records that result from the identification, evaluation, and/or treatment of historic properties on Corps land pursuant to this PA shall be curated and properly maintained in accordance with the requirements of 36 CFR Part 79 (see Stipulation XIII for treatment of NAGPRA-related items).

B. The Corps will ensure that any archaeological materials excavated or otherwise recovered from non-Federal land during implementation of the undertaking shall be handled and maintained in accordance with 36 CFR § 79 until all necessary analyses of such materials have been completed as outlined in an HPTP, as applicable.

C. For any collections made on private lands, the Corps will encourage the landowner(s) to consent to the curation of archaeological materials recovered from their lands in a museum or repository that meets the requirements of 36 CFR § 79 upon the completion of all necessary analyses. If a private landowner does not consent to the curation of recovered archaeological materials, the Corps will return the materials to the landowner(s) and encourage them to rebury the returned items close to their original location, if possible, based on Project requirements. The Corps will document the return and submit copies of this documentation to the parties named in the specific HPTP within thirty (30) days of such return.

D. The HPTP developed under this PA will detail the types of materials, if any, proposed for curation as a part of this project. If items are to be curated in a museum or other repository, the Corps will ensure that documentation of the curation of these materials is prepared and provided to the parties named in the HPTP, specific to the resolution of effects for that historic property, within thirty (30) days of curation of the materials.

E. The Corps will consult with Indian tribes and other Native American interested parties regarding the curation of any Native American archaeological materials collected during the course of the Project, as described in Stipulation IX (Native American Consultation and Participation).

IX. NATIVE AMERICAN CONSULTATION AND PARTICIPATION

A. The Corps shall make a reasonable and good-faith effort to ensure that Indian tribes and other Native American interested parties identified by the California Native American Heritage Commission as having cultural ties or interests in the APE, have the opportunity to participate in the development and implementation of the terms of this PA, including, but not limited to, the identification of historic properties within the Project APE,

National Register of Historic Places eligibility determinations, findings of effect, and the resolution of adverse effects to historic properties.

B. The Corps shall ensure that Native American consultation regarding the Project continues throughout the Section 106 process. Section 106 Consultation may be carried out via letters of notification, public meetings, site visits, and/or other appropriate methods.

C. Failure of any contacted group to comment within thirty (30) calendar days shall not preclude the Corps from proceeding with the Project as proposed.

X. PUBLIC AND CONSULTING PARTY PARTICIPATION

A. Individuals, organizations, and local agencies with a demonstrated interest in the Project may be invited to participate as Concurring Parties to this PA and consulting parties for the undertaking, to provide input on the identification, evaluation, and proposed treatment of historic properties consistent with 36 CFR §§ 800.2(c)(5) and 800.2(d). Public input will be sought and received through Section 106 letters of notification, public meetings, or by other means and venues.

B. Information regarding the undertaking that is released to the public will comply with Stipulation XIII (Confidentiality); 36 CFR § 800.2(d)(1-2) and 800.11(c)(1) and (3); Section 304 of the NHPA, as amended (54 U.S.C. § 307103); Section 9 of the Archaeological Resources Protection Act (10 U.S.C. § 470aa – 470mm); Executive Order on Sacred Sites 13007, dated May 24, 1996; the Freedom of Information Act (FOIA) (5 USC § 552); and Section 6254.10 of the California Government Code, as applicable.

XI. NOTICES TO PROCEED WITH CONSTRUCTION

A. Notices to Proceed (NTPs) may be issued by the Corps for a Project phase under any of the following conditions:

1. The Corps, in consultation with the SHPO, Concurring Parties, Indian tribes, other Native American interested parties, and/or other consulting parties, has determined that there are no historic properties present within the APE for the Project phase.

2. The Corps, in consultation with the SHPO, Concurring Parties, Indian tribes, other Native American interested parties, and/or other consulting parties, has determined that there will be no adverse effect to historic properties within the APE for the Project phase.

3. Mitigation measures to resolve adverse effects to historic properties have been documented in an HPTP that has been reviewed according to Stipulation I (Timeframes and Review Procedures) and Stipulation IX (Native American

Consultation And Participation), or otherwise have been agreed to in consultation with the SHPO, Concurring Parties, Indian tribes, other Native American interested parties, and/or other consulting; the fieldwork portion of treatment has been completed; and the Corps has accepted a fieldwork summary and a schedule for final reporting of that work.

XII. PROFESSIONAL QUALIFICATIONS AND STANDARDS

A. The Corps will ensure that all actions prescribed in this PA that involve the identification, evaluation, analysis, recording, treatment, monitoring, or disposition of historic properties, or that involve reporting or documentation of such actions in the form of reports, forms, or other records, shall be carried out by or under the direct supervision of a person or persons who meet the Secretary of Interior's Professional Qualifications Standards (48 FR 44738-44739; Appendix A to 36 CFR 61) in the appropriate discipline.

B. Historic preservation activities carried out pursuant to this PA shall meet the *Secretary of Interior's Standards and Guidelines for Archaeology and Historic Preservation* (48 FR 44716-44740), as well as standards and guidelines for historic preservation activities established by the SHPO.

XIII. CONFIDENTIALITY

A. Information regarding the nature and location of Native American archaeological sites and any other Native American cultural resources identified or discussed pursuant to this PA shall be limited to appropriate Corps personnel, Corps contractors, Indian tribes and Native American consulting parties, the SHPO, and other parties involved in developing, reviewing, and implementing this PA, to the extent permitted by law.

XIV. DISPUTE RESOLUTION

A. Should any Signatory or Concurring Party to this PA object at any time to any actions proposed or the manner in which the terms of this PA are implemented, the Corps shall notify the other parties to the PA and consult with the objecting party to resolve the objection. If the Corps determines that such objection cannot be resolved, the Corps will:

1. Forward all documentation relevant to the dispute, including the Corps' proposed resolution, to the ACHP. The ACHP shall provide the Corps with its advice on the resolution of the objection within thirty (30) days of receiving adequate documentation. Prior to reaching a final decision on the dispute, the Corps shall prepare a written response that takes into account any timely advice or comments regarding the dispute from the ACHP, Signatories and Concurring Parties, and provide them with a copy of this written response. The Corps will then proceed according to its final decision.

2. If the ACHP does not provide its advice regarding the dispute within the thirty (30) day time period, the Corps may make a final decision on the dispute and proceed accordingly. Prior to reaching such a final decision, the Corps shall prepare a written response that takes into account any timely comments regarding the dispute from the Signatories and Concurring Parties to the PA, and provide them and the ACHP with a copy of such written response

3. The Corps' responsibility to carry out all other actions subject to the terms of this PA that are not the subject of the dispute remain unchanged.

XV. AMENDMENT

A. Any Signatory Party to this PA may propose that the PA be amended, whereupon the Corps shall consult with the SHPO to consider such an amendment. The PA may be amended only upon written concurrence by all Signatory Parties.

B. Any attachments to the PA, the APE, and HPTPs developed pursuant to the PA may be modified or revised, or updated through consultation consistent with Stipulation I (Timeframes and Review Procedures) without requiring amendment of this PA.

XVI. ANNUAL REPORTING

A. The Corps shall provide the parties to this PA an annual summary report detailing work undertaker pursuant to its terms. Such report shall include any scheduling changes proposed, any problems encountered, and any disputes and objections received in the Corps' efforts to carry out the terms of this PA. The Corps will provide the initial annual summary report on or before December 31, 2020, and provide subsequent reports on or before December 31 each year following until the PA expires or is terminated. Review of the annual summary report shall follow the procedure outlined in Stipulation I. At the request of any Signatory or Concurring Party to this PA, or if otherwise deemed necessary, the Corps shall ensure that one or more meetings are held to facilitate review, address questions, or resolve comments.

XVII. TERMINATION

A. Only the Signatory Parties may terminate this PA. Any Signatory proposing termination shall notify the other Signatories in writing, explain the reasons for proposing termination, and consult with the other Signatories to seek alternatives to termination, within thirty (30) calendar days of the notification. Should such consultation result in an agreement on an alternative to termination, the Signatory Parties shall proceed in accordance with that agreement.

B. Should such consultation fail, the Signatory Party proposing termination may terminate this PA by notifying the other Signatory Parties and Concurring Parties in writing. Beginning with the date of termination, the Corps shall ensure that until and unless a new PA is executed for the actions covered by this PA, such actions shall be reviewed individually in accordance with 36 CFR Part 800.

XVIII. DURATION

A. Unless terminated pursuant to Stipulation XVI or amended pursuant to Stipulation XV of this agreement, this PA will be in effect following its execution by the Signatory Parties until the Corps in consultation with the other parties to this PA, determines that all terms of this PA have been satisfactorily fulfilled, or within five (5) years of execution of this PA, whichever comes first. Upon a determination that all terms of this PA have been satisfactorily fulfilled, Corps will immediately notify the other parties to this PA in writing that all terms of this PA have been satisfactorily fulfilled and this agreement will have no further force or effect.

B. No less than 120 days prior to expiration of the PA, the Signatories will consult whether to extend the duration of the PA. If the Signatories agree to extend the PA, it shall be amended in accordance with Stipulation XV.A.

XIX. EFFECTIVE DATE

A. The PA shall take effect on the date that it has been fully executed by the Corps and the SHPO.

EXECUTION of this PA by the Corps and the SHPO, its transmittal to the ACHP, and subsequent implementation of its terms evidence that the Corps has afforded the ACHP an opportunity to comment on the undertaking and its effects on historic properties, that the Corps has taken into account the effects of the undertaking on historic properties, and that the Corps has satisfied its responsibilities under Section 106 of the NHPA and applicable implementing regulation for all aspects of the undertaking.

PROGRAMMATIC AGREEMENT
BETWEEN
THE U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT
AND
THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER
REGARDING
THE TULE RIVER SPILLWAY ENLARGEMENT PROJECT

SIGNATORY:

U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT

BY: _____ DATE: 12/12/19

James J. Handura, Colonel, U.S. Army Corps of Engineers, District Commander

PROGRAMMATIC AGREEMENT
BETWEEN
THE U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT
AND
THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER
REGARDING
THE TULE RIVER SPILLWAY ENLARGEMENT PROJECT

SIGNATORY:

CALIFORNIA ~~STATE H~~HISTORIC PRESERVATION OFFICER

BY: _____ DATE: 12/13/19

for Julianne Polanco, State Historic Preservation Officer

PROGRAMMATIC AGREEMENT
BETWEEN
THE U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT
AND
THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER
REGARDING
THE TULE RIVER SPILLWAY ENLARGEMENT PROJECT

CONCURRING PARTY:

LOWER TULE RIVER IRRIGATION DISTRICT

BY: _____ DATE: 12/12/19

PROGRAMMATIC AGREEMENT
BETWEEN
THE U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT
AND
THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER
REGARDING
THE TULE RIVER SPILLWAY ENLARGEMENT PROJECT

CONCURRING PARTY:

LOWER TULE RIVER IRRIGATION DISTRICT

BY: _____ DATE: _____

PROGRAMMATIC AGREEMENT
BETWEEN
THE U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT
AND
THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER
REGARDING
THE TULE RIVER SPILLWAY ENLARGEMENT PROJECT

CONCURRING PARTY:

KERN VALLEY INDIAN COMMUNITY

BY: _____ DATE: _____

PROGRAMMATIC AGREEMENT
BETWEEN
THE U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT
AND
THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER
REGARDING
THE TULE RIVER SPILLWAY ENLARGEMENT PROJECT

CONCURRING PARTY:

TUBATAULABALS OF KERN COUNTY

BY: _____ DATE: _____

PROGRAMMATIC AGREEMENT
BETWEEN
THE U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT
AND
THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER
REGARDING
THE TULE RIVER SPILLWAY ENLARGEMENT PROJECT

CONCURRING PARTY:

TULE RIVER INDIAN TRIBE

BY: _____ DATE: _____

PROGRAMMATIC AGREEMENT
BETWEEN
THE U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT
AND
THE CALIFORNIA STATE HISTORIC PRESERVATION OFFICER
REGARDING
THE TULE RIVER SPILLWAY ENLARGEMENT PROJECT

CONCURRING PARTY:

WUKSACHE INDIAN TRIBE/ESHOM VALLEY BAND

BY: _____ DATE: _____

APPENDIX A

Tule River Spillway Enlargement Project

Area of Potential Effects

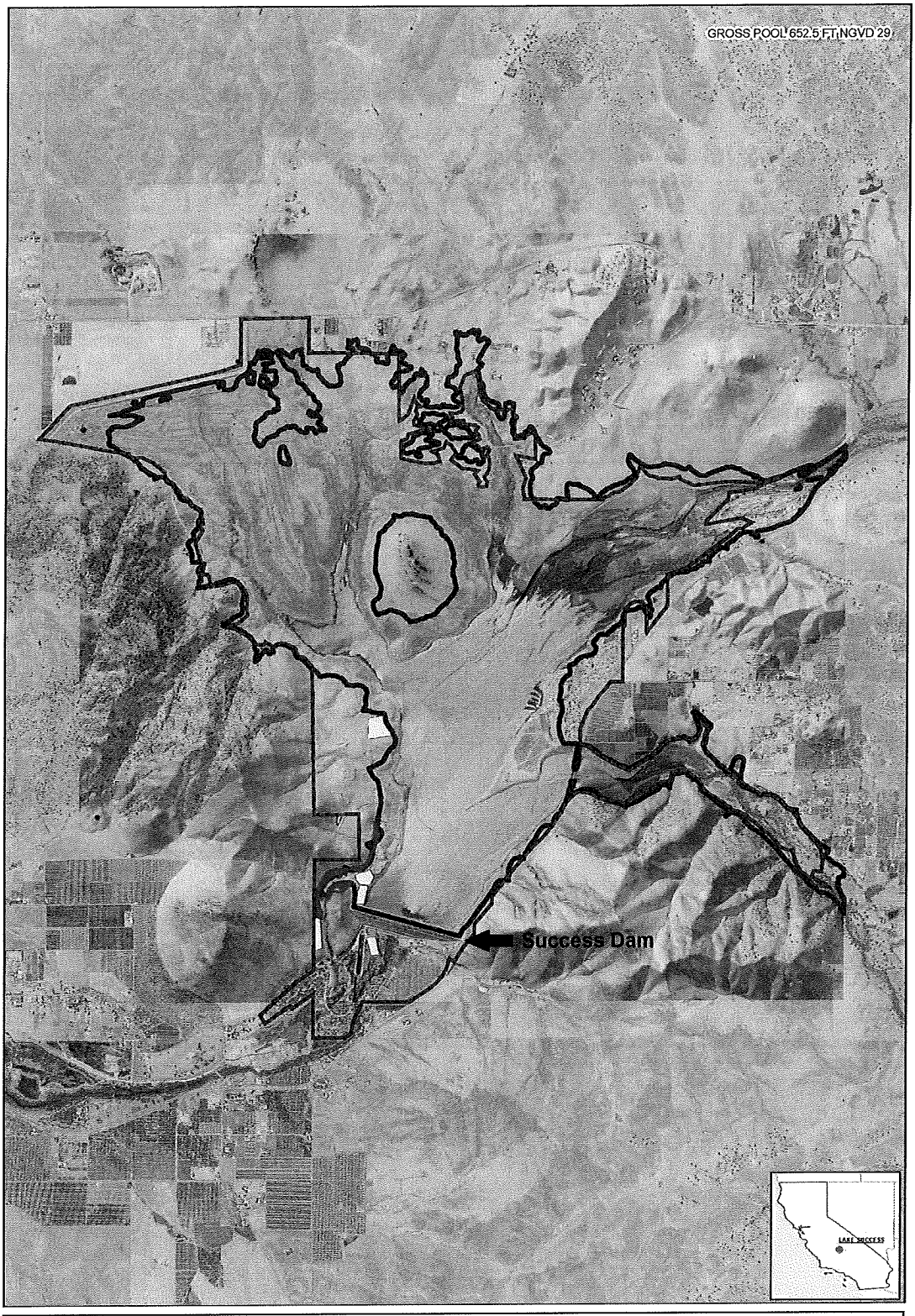

Figure 1. Project Location Map

USACE Property Boundary
Spillway Cut APE
Reservoir Raise APE
Staging and Stockpiling APE

US Army Corps of Engineers
Sacramento District

0 0.25 0.5 1 Miles

N

Tule River Spillway Enlargement Project

14 JUNE 2019

APPENDIX B

Tule River Spillway Enlargement Project

OUTLINE – Historic Properties Treatment Plan

Tule River Spillway Enlargement Project HPTP Outline

1. INTRODUCTION
   Purpose and Need
   Regulatory Context
   Programmatic Agreement
   Area of Potential Effects
   Identification of Historic Properties
   Report Organization

2. NATURAL AND CULTURAL CONTEXT
   Environmental Context
   Native American Context
   Ethnohistorical Context
   Historical Context

3. RECORDS SEARCH AND INVENTORY RESULTS
   Archaeological Resources
   Historical Built Environment Resources

4. EVALUATION AND TREATMENT OF PRECONTACT ARCHAEOLOGICAL PROPERTIES
   Research Topics and Themes
   Property Types
   Evaluative Framework
   Treatment Options

5. EVALUATION AND TREATMENT OF HISTORICAL ARCHAEOLOGICAL PROPERTIES
   Research Topics and Themes
   Property Types
   Evaluative Framework
   Treatment Options

6. EVALUATION AND TREATMENT OF HISTORICAL BUILT ENVIRONMENT PROPERTIES
   Research Topics and Themes
   Property Types
   Evaluative Framework
   Treatment Options

7. BURIED SITE SENSITIVITY
   Sensitivity Analysis
   Identification Strategies

8. POST-REVIEW DISCOVERIES
   Actions Subsequent to Discovery
   Treatment Procedures
   Monitoring Protocols

9. NATIVE AMERICAN COORDINATION
   Consultation History
   Protocols for Continuing Outreach and Consultation

10. TREATMENT OF NATIVE AMERICAN HUMAN REMAINS AND CULTURAL ITEMS
    Native American Graves Protection and Repatriation Act
    NAGPRA Plan of Action/Burial Treatment Plan

11. HPTP IMPLEMENTATION
    Roles and responsibilities
    Reporting requirements
    Professional Qualifications and Standards
    Curation Plan

12. REFERENCES

13. APPENDICES
    Programmatic Agreement
    Burial Treatment Plan/NAGPRA Plan of Action

APPENDIX C - AIR QUALITY MODELING

Welcome to the Road Construction Emissions Model, Version 9.0.0

User Instructions

This spreadsheet system contains the following individual worksheets:

1 This worksheet of User Instructions
2 Updates
3 Emission Estimates
4 Data Entry
5 Non-default Off-road Equipment
6 EMFAC2017
7 On-road Mitigation EF
8 OFFROAD Convert
9 Off-road Tier 4 EF
10 OFFROAD HP & LF
11 OFFROAD EF
12 x-ref

The Emission Estimates worksheet calculates a project's emissions in pounds per day (and tons) by project phase and tons over the entire construction period.
The worksheet can be used to estimate emissions for both vehicle exhaust and fugitive dust. The methodology used to estimate fugitive dust emissions is a simplified methodology involving estimates of the maximum area (acreage) of land disturbed daily. Detailed fugitive dust emission estimates associated with individual materials handling operations and/or activity/vehicle types cannot be conducted with this version of the model.
The Emission Estimates worksheet cannot be modified directly, it is a protected worksheet. It can only be modified indirectly by entering information for the project in selected areas of the Data Entry worksheet.
by the user.
They are protected worksheets.
Even though all or portions of several worksheets are protected, the individual formulas used in the calculations can be seen by the user.
The Data Entry worksheet includes several areas that can be modified by the user.
User instructions in the Data Entry worksheet are highlighted in red.
On the Data Entry worksheet, the user has two options for entering project data: required data and optional data. Required data is entered in the data input section (yellow cells). That required data is then used by the worksheet to calculate default values for the project.
The user can override the default values (blue cells) calculated for a project and is encouraged to do so if project specific information is available. Due to the difficulty in developing reliable default values for road construction projects, the user is encouraged to enter as much site specific information as is available for the project being analyzed.
The Data Entry Worksheet also includes a button that allows the user to clear previously entered data. This button is found just at the top of and to the right of the data entry portion of the worksheet.
When projects are discontinuous, the user must make adjustments to the spreadsheet manually, since the program cannot be setup to anticipate unexpected project delays.

#VALUE! <- This error message may occur during use of the spreadsheets. This occurs whenever the user enters a non numeric value, including a space character, into a cell that is used to calculate a numeric value. Consequently, to erase values entered into the spreadsheets, use the delete key instead of the space bar!

Note: Information in this worksheet is based on conversations with knowledgeable individuals at the Sacramento Metropolitan Air Quality Management District, the California Department of Transportation, the California Air Resources Board, the U.S. EPA, and private industry involved in road construction. Also, the 26th edition of Walker's Building Estimator's Reference Book (1999) was used in the development of this spreadsheet. This spreadsheet was prepared by Jones & Stokes, TIAX LLC and Ramboll Environ with the financial support and direction of the Sacramento Metropolitan Air Quality Management District.

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Road Construction Emissions Model, Version 9.0.0

Daily Emission Estimates for -> Tule River Road Realignment without Mitigation				Total	Exhaust	Fugitive Dust	Total	Exhaust	Fugitive Dust					
Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	PM10 (lbs/day)	PM10 (lbs/day)	PM10 (lbs/day)	PM2.5 (lbs/day)	PM2.5 (lbs/day)	PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation	12.52	93.71	143.23	131.20	6.20	125.00	31.58	5.58	26.00	0.20	19,936.82	5.51	0.47	20,213.24
Drainage/Utilities/Sub-Grade	10.86	87.56	112.84	130.16	5.16	125.00	30.79	4.79	26.00	0.18	17,032.08	3.61	0.28	17,206.64
Paving	3.96	39.37	39.97	2.21	2.21	0.00	1.95	1.95	0.00	0.07	7,073.42	1.68	0.25	7,191.09
Maximum (pounds/day)	12.52	93.71	143.23	131.20	6.20	125.00	31.58	5.58	26.00	0.20	19,936.82	5.51	0.47	20,213.24
Total (tons/construction project)	1.40	10.94	15.46	14.44	0.69	13.75	3.49	0.63	2.86	0.02	2,236.83	0.57	0.05	2,265.91

Notes:

Project Start Year ->	2020
Project Length (months) ->	12
Total Project Area (acres) ->	50
Maximum Area Disturbed/Day (acres) ->	13
Water Truck Used? ->	Yes

	Total Material Imported/Exported Volume (yd^3/day)		Daily VMT (miles/day)			
Phase	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	0	0	0	0	0	0
Grading/Excavation	992	0	300	0	1,560	120
Drainage/Utilities/Sub-Grade	331	0	102	0	1,480	80
Paving	0	663	0	204	920	80

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> Tule River Road Realignment without Mitigation				Total	Exhaust	Fugitive Dust	Total	Exhaust	Fugitive Dust					
Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	PM10 (tons/phase)	PM10 (tons/phase)	PM10 (tons/phase)	PM2.5 (tons/phase)	PM2.5 (tons/phase)	PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation	0.90	6.70	10.24	9.38	0.44	8.94	2.26	0.40	1.86	0.01	1,425.48	0.39	0.03	1,311.12
Drainage/Utilities/Sub-Grade	0.42	3.37	4.34	5.01	0.20	4.81	1.19	0.18	1.00	0.01	655.73	0.14	0.01	600.98
Paving	0.09	0.87	0.88	0.05	0.05	0.00	0.04	0.04	0.00	0.00	155.62	0.04	0.01	143.52
Maximum (tons/phase)	0.90	6.70	10.24	9.38	0.44	8.94	2.26	0.40	1.86	0.01	1425.48	0.39	0.03	1,311.12
Total (tons/construction project)	1.40	10.94	15.46	14.44	0.69	13.75	3.49	0.63	2.86	0.02	2236.83	0.57	0.05	2,055.62

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

The CO2e emissions are reported as metric tons per phase.

Road Construction Emissions Model, Version 9.0.0

Daily Emission Estimates for -> Tule River Road Realignment with Tier 4 Mitigation

Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	1.28	25.86	3.78	0.20	0.20	0.00	0.18	0.18	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation	6.19	112.96	19.97	125.99	0.99	125.00	26.79	0.79	26.00	0.20	19,936.82	5.51	0.47	20,213.24
Drainage/Utilities/Sub-Grade	5.07	99.39	14.92	125.83	0.83	125.00	26.66	0.66	26.00	0.18	17,032.08	3.61	0.28	17,206.64
Paving	2.17	44.43	9.87	0.48	0.48	0.00	0.36	0.36	0.00	0.07	7,073.42	1.68	0.25	7,191.09
Maximum (pounds/day)	6.19	112.96	19.97	125.99	0.99	125.00	26.79	0.79	26.00	0.20	19,936.82	5.51	0.47	20,213.24
Total (tons/construction project)	0.69	12.88	2.22	13.86	0.11	13.75	2.95	0.09	2.86	0.02	2,236.83	0.57	0.05	2,265.91

Notes:

Project Start Year ->	2020
Project Length (months) ->	12
Total Project Area (acres) ->	50
Maximum Area Disturbed/Day (acres) ->	13
Water Truck Used? ->	Yes

	Total Material Imported/Exported Volume (yd^3/day)		Daily VMT (miles/day)			
Phase	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	0	0	0	0	0	0
Grading/Excavation	992	0	300	0	1,560	120
Drainage/Utilities/Sub-Grade	331	0	102	0	1,480	80
Paving	0	663	0	204	920	80

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> Tule River Road Realignment with Tier 4 Mitigation

Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation	0.44	8.08	1.43	9.01	0.07	8.94	1.92	0.06	1.86	0.01	1,425.48	0.39	0.03	1,311.12
Drainage/Utilities/Sub-Grade	0.20	3.83	0.57	4.84	0.03	4.81	1.03	0.03	1.00	0.01	655.73	0.14	0.01	600.98
Paving	0.05	0.98	0.22	0.01	0.01	0.00	0.01	0.01	0.00	0.00	155.62	0.04	0.01	143.52
Maximum (tons/phase)	0.44	8.08	1.43	9.01	0.07	8.94	1.92	0.06	1.86	0.01	1425.48	0.39	0.03	1,311.12
Total (tons/construction project)	0.69	12.88	2.22	13.86	0.11	13.75	2.95	0.09	2.86	0.02	2236.83	0.57	0.05	2,055.62

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

The CO2e emissions are reported as metric tons per phase.

APPENDIX D - ENVIRONMENTAL NOISE ANALYSIS

This appendix summarizes environmental noise considerations for evaluating the effects of construction noise on the area surrounding the proposed action at Success Dam and Lake, Tulare County, California.

Characteristics of Environmental Noise

Noise is generally defined as loud, unpleasant, unexpected, or undesired sound that disrupts or interferes with normal human activities. Although exposure to high noise levels has been demonstrated to cause hearing loss, the principal human response to environmental noise is annoyance. The response of individuals to similar noise events is diverse and influenced by the type of noise, the perceived importance of the noise and its appropriateness in the setting, the time of day and the type of activity during which the noise occurs, and the sensitivity of the individual.

Sound is a physical phenomenon consisting of minute pressure variations that travel through a medium, such as air, and are sensed by the human ear. Sound is generally characterized by a number of variables, including frequency and intensity. Frequency describes the sound's pitch and is measured in hertz (Hz), while intensity describes the sound's loudness and is measured in decibels (dB). Decibels are measured using a logarithmic scale. A sound level of 0 dB is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB. Sound levels above about 120 dB begin to be felt inside the human ear as discomfort and eventually pain at still higher levels.

Because of the logarithmic nature of the decibel, sound levels cannot be added or subtracted directly and are somewhat cumbersome to handle mathematically. However, some simple rules of thumb are useful in dealing with sound levels. First, if a sound's intensity is doubled, the sound level increases by 3 dB, regardless of the initial sound level. Thus, for example: 60 dB + 60 dB = 63 dB, and 80 dB + 80 dB = 83 dB.

Hertz is an indicator of the rate at which pressure fluctuations occur. For example, when a drummer beats a drum, the skin of the drum vibrates a number of times per second. A particular tone that makes the drum skin vibrate 100 times per second generates a sound pressure wave that is oscillating at 100 Hz, and this pressure oscillation is perceived as a tonal pitch of 100 Hz. Sound frequencies between 20 Hz and 20,000 Hz are within the range of sensitivity of the best human ear.

Sound from a tuning fork contains a single frequency referred to as a tone. In contrast, most sounds heard in the environment do not consist of a single frequency but a broad band of frequencies differing in sound level. The method commonly used to quantify environmental sounds consists of evaluating all of the frequencies of a sound according to a weighting system that reflects how human hearing is less sensitive at lower frequencies and higher frequencies than at the mid-range frequencies, about 200 Hz to 5,000 Hz. The most commonly used filter introduces an A weighting, and the decibel level measured is called the A-weighted sound level (dBA). In practice, the level of a noise source is conveniently measured using a sound level meter that includes a filter corresponding to the dBA curve.

Although the A-weighted sound level may adequately indicate the level of environmental noise at any instant in time, community noise levels vary continuously. Most environmental noise includes a conglomeration of noise from distant sources that creates a relatively steady background noise in which no particular source is identifiable. A single descriptor called the equivalent sound level (L_{eq}) is used. The Leq is the energy-mean A-weighted sound level during

a measured interval. It is the "equivalent" constant sound level that would have to be produced by a given source to equal the fluctuating level measured.

Two other descriptors describe noise exposure over a 24-hour period. The first is known as the day-night average noise Level (Ldn). It is calculated by adding a 10-decibel penalty to sound levels at night (10:00 PM to 7:00 AM) to compensate for the increased sensitivity to noise during the quieter nighttime hours. The Ldn is used by jurisdictions (such as the State of California and Tulare County) to define acceptable land use compatibility with respect to noise. Figure includes sound levels of typical noise sources and environments to provide a frame of reference.

Table D-1. Typical Noise Levels (CalTrans 2019a)

Common Outdoor Activities	**Noise Level (dBA)**	**Common Indoor Activities**
Jet flyover at 1,000 feet	--110--	Rock band
Gas lawnmower at 3 feet	--100--	
Diesel truck at 50 feet at 50 mph	--90--	Food blender at 3 feet
Noisy urban area, daytime	--80--	Garbage disposal at 3 feet
Gas lawnmower, 100 feet	--70--	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	--60--	Large business office
Quiet urban daytime	--50--	Dishwasher in next room
Quiet urban nighttime	--40--	Theater, large conference room (background)
Quiet suburban nighttime	--30--	Library
Quiet rural nighttime	--20--	Bedroom at night, concert hall (background)
	--10--	Broadcast/recording studio
Lowest threshold of human hearing	--0--	

The second sound level descriptor commonly used to describe noise exposure over a 24-hour period is known as the CNEL. This is similar to the Ldn described above but with an additional 5 dBA "penalty" added to noise events that occur during the noise-sensitive hours between 7:00 PM and 10:00 PM, which are typically reserved for relaxation, conversation, reading, and television. If using the same 24-hour noise data, the reported CNEL is typically approximately 0.5 dBA higher than the L_{dn}.

With respect to how humans perceive and react to changes in noise levels, a 1-dBA increase is imperceptible, a 3-dBA increase is barely perceptible, a 6-dBA increase is clearly noticeable, and a 10-dBA increase is subjectively perceived as approximately twice as loud (Egan 1988), as presented in Figure. This table was developed on the basis of test subjects' reactions to changes in the levels of steady-state pure tones or broadband noise and to changes in levels of a given noise source. It is probably most applicable to noise levels in the range of 50 to 70 dBA, as this is the usual range of voice and interior noise levels.

Table D-2. Subjective Reaction to Changes in Noise Levels of Similar Sources

Change in Level (dBA)	Subjective Reaction	Factor Change in Acoustical Energy
1	Imperceptible (except for tones)	1.3
3	Just barely perceptible	2.0
6	Clearly noticeable	4.0
10	About twice (or half) as loud	10.0

Source: Architectural Acoustics, M. David Egan, 1988

Sound Propagation and Attenuation

As sound propagates from the source to the receptor, its attenuation, or manner of noise reduction in relation to distance, depends on surface characteristics, atmospheric conditions, and the presence of physical barriers. The inverse-square law describes the attenuation caused by the pattern in which sound travels from the source to receptor. Sound travels uniformly outward from a point source in a spherical pattern with an attenuation rate of 6 dBA per doubling of distance (dBA/DD). However, from a line source (e.g., a road), sound travels uniformly outward in a cylindrical pattern with an attenuation rate of 3 dBA/DD. The surface characteristics between the source and the receptor may result in additional sound absorption or reflection. Atmospheric conditions, such as wind speed, temperature, and humidity, may affect noise levels. Furthermore, the presence of a barrier between the source and the receptor may also attenuate noise levels. The actual amount of attenuation depends on the size of the barrier and the frequency of the noise. A noise barrier may be any natural or human-made feature, such as a hill, tree, building, wall, or berm (CalTrans 2019b).

All buildings provide some exterior-to-interior noise reduction. A building constructed with a wood frame and stucco or wood sheathing exterior and dual pane windows typically provides a minimum exterior-to-interior noise reduction of 25 dBA with its windows closed. A typical mobile home or light frame structure would be expected to provide an exterior-to-interior noise level reduction of 15 to 20 dBA with windows closed (FHWA 2010).

Noise Descriptors

Environmental noise generally derives, in part, from a conglomeration of distant noise sources. Such sources may include distant traffic, wind in trees, and distant industrial or farming activities, and all part of our daily lives. These distant sources create a low-level background noise in which no particular individual source is identifiable. Background noise is often relatively constant from moment to moment but varies slowly from hour to hour as natural forces change or as human activity follows its daily cycle. Superimposed on this low-level, slow varying background noise is a succession of identifiable noise events of relatively brief duration. These events may include single-vehicle passbys, aircraft flyovers, screeching brakes, and other short-term events, all causing noise level to fluctuate significantly from moment to moment (FHWA 2006).

It is possible to describe these fluctuating noises in the environment using single-number descriptors. To do this allows manageable measurement, computations, and impact assessment.

The following are some of the descriptors commonly used in environmental noise assessment, including this report:

- **L_{max} (Maximum Noise Level) –** The maximum instantaneous noise level during a specific period. The L_{max} may also be referred to as the "peak (noise) level";
- **L_{min} (Minimum Noise Level) –** The minimum instantaneous noise level during a specific period;
- **L_X (Statistical Descriptor) –** The noise level exceeded X percent of a specific period;
- **L_{eq} (Equivalent Noise Level) –** The energy mean (average) noise level. The instantaneous noise levels during a specific period in dBA are converted to relative energy values. From the sum of the relative energy values, an average energy value is calculated, which is then converted back to dBA to determine the L_{eq}. In noise environments determined by major noise events, such as aircraft overflights, the L_{eq} value is heavily influenced by the magnitude and number of single events that produce the high noise levels;
- **L_{dn} (Day-Night Noise Level) –** The 24-hour L_{eq} with a 10 dBA penalty for noise events that occur during the noise-sensitive hours between 10:00 PM and 7:00 AM. In other words, 10 dBA is added to noise events that occur in the nighttime, and this generates a higher reported noise level when determining compliance with noise standards. The L_{dn} attempts to account for increased sensitivity to noise at night, when most people are asleep.
- **CNEL (Community Noise Equivalent Level) –** The CNEL is similar to the L_{dn} described above but with an additional 5 dBA penalty added to noise events that occur during the noise-sensitive hours between 7:00 PM and 10:00 PM, which are typically reserved for relaxation, conversation, reading, and television. If using the same 24-hour noise data, the reported CNEL is typically approximately 0.5 dBA higher than the L_{dn}.
- **SEL (Sound Exposure Level) –** The SEL represents the total sound energy of one noise event, typically a vehicle passby or other discrete operation. SELs typically represent the noise events used to calculate the L_{eq}, L_{dn}, and CNEL.

Characteristics of Construction Vibration

Vibration is the periodic oscillation of a medium or object. The rumbling caused by the vibration of room surfaces is called structure-borne noise. Sources of ground-borne vibrations include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) or human-made causes (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous, such as factory machinery, or transient, such as explosions. As is the case with airborne sound, ground-borne vibrations may be described by amplitude and frequency.

Vibration amplitudes are usually expressed in PPV or RMS, as in RMS vibration velocity. The PPV and RMS velocity are normally described in inches per second. PPV is defined as the maximum instantaneous positive or negative peak of a vibration signal. PPV is often used in monitoring blasting vibration because it is related to the stresses that are experienced by buildings (FHWA 2006; CalTrans 2013).

Although PPV is appropriate for evaluating the potential for building damage, it is not always suitable for evaluating human response. It takes some time for the human body to respond to vibration signals. In a sense, the human body responds to average vibration amplitude. The RMS of a signal is the average of the squared amplitude of the signal, typically calculated over a 1-second period. As with airborne sound, the RMS velocity often expressed in decibel notation as VdB, which serves to compress the range of numbers required to describe vibration (FHWA 2006). This is based on a reference value of 1 μin/sec.

The background vibration-velocity level in residential areas is usually approximately 50 VdB. Ground-borne vibration is normally perceptible to humans at approximately 65 VdB. For most people, a vibration-velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels (FHWA 2006).

Typical outdoor sources of perceptible ground-borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the ground-borne vibration is rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration-velocity level, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings. Construction can generate ground-borne vibrations, which can pose a risk to nearby structures. Constant or transient vibrations can weaken structures, crack facades, and disturb occupants (FHWA 2006).

Construction vibrations can be transient, random, or continuous. Transient construction vibrations generated by blasting, impact pile driving, and wrecking balls. Continuous vibrations result from vibratory pile drivers, large pumps, horizontal directional drilling, and compressors. Random vibration can result from jackhammers, pavement breakers, and heavy construction equipment. Figure describes the general human response to different levels of ground-borne vibration-velocity levels.

Table D-3. Human Response to Ground-Borne Vibration Levels

Vibration Velocity VdB	Human Response
65	Approximate threshold of perception for many humans.
75	Approximate dividing line between barely perceptible and distinctly perceptible.
85	Vibration acceptable only if there are an infrequent number of events per day.

Source: FHWA 2006

Construction-related activities would generate noise levels from heavy-duty truck travel on proposed haul routes for material transport and heavy-duty construction equipment at the proposed dam construction, staging, and borrow sites. Construction equipment would likely include scrapers, excavators, bulldozers, compactors, loaders, trucks, crushers, pumps, generators, and other miscellaneous pieces of equipment. Typical noise levels of construction equipment and a typical usage factor for each equipment type used in the analysis of potential impacts are shown in Figure. The usage factor is an estimate of the fraction of time each piece of equipment operates at full power.

Table D-4. Typical Construction Equipment Noise

Equipment	L_{max} Noise Limit at 50 feet, dB, Slow	Usage Factor	Impact Device?
All other equipment more than 5 horsepower	85	50	No
Auger drill rig	85	20	No
Backhoe	80	40	No
Bar bender	80	20	No
Blasting	94	N/A	Yes
Boring jack power unit	80	50	No
Chain saw	85	20	No
Clam shovel	93	20	Yes
Compactor (ground)	80	20	No
Compressor (air)	80	40	No
Concrete batch plant	83	15	No
Concrete mixer truck	85	40	No
Concrete pump truck	82	20	No
Concrete saw	90	20	No
Crane (mobile or stationary)	85	16	No
Dozer	85	40	No
Dump truck	84	40	No
Excavator	85	40	No
Flatbed truck	84	40	No
Front end loader	80	40	No
Generator (25 kilovolt-amperes [kVA] or less)	70	50	No
Generator (more than 25 kVA)	82	50	No
Gradall	85	40	No
Grader	85	40	No
Horizontal boring hydraulic jack	80	25	No
Hydra break ram	90	10	Yes
Impact pile driver (diesel or drop)	95	20	Yes
Jackhammer	85	20	Yes
Mounted impact hammer (hoe ram)	90	20	Yes
Paver	85	50	No
Pickup truck	55	40	No
Pneumatic tools	85	50	No
Pumps	77	50	No
Rock drill	85	20	No
Scraper	85	40	No
Slurry plant	78	100	No
Slurry trenching machine	82	50	No
Soil mix drill rig	80	50	No
Tractor	84	40	No
Vacuum street sweeper	80	10	No
Vibratory concrete mixer	80	20	No
Vibratory pile driver	95	20	No
Welder/Torch	73	40	No

Source: Federal Highway Administration 2006.

Blasting Noise

The Corps has determined that some short-duration controlled blasting would need to take place to break up the bedrock within the proposed Emergency Spillway channel. A *Controlled Blasting Management Plan* would be developed by the Corps or designated contractor prior to the start of construction, which would include any short-term road

closures and other public safety management measures that may be required in the vicinity of the blasting.

Blasting generally includes a series of small charges or shots, which are placed in holes drilled into the rock formation. The charges or shots are detonated and are timed so that they occur in sequence (generally milliseconds apart). This is referred to as the "shot timing". The noise levels associated with blasting are generally a function of shot sizes, number of shots, depth of the blasting charges and the shot timing. Noise levels associated with blasting is generally very low frequency in nature. Assuming a Controlled Blasting Management Plan would be developed and followed the short duration blasting noise impacts associated with this alternative are anticipated to be low to moderate and less-than–significant.

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APPENDIX E - BIOLOGICAL OPINION FROM US FISH AND WILDLIFE SERVICE

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Suite W-2605
Sacramento, California 95825-1846

In Reply Refer to:
08ESMF00-
2019-F-2501-
R001

FEB 19 2020

Ms. Mark T. Ziminske
Chief, Environmental Resources Branch
U.S. Army Corps of Engineers, Sacramento District
1325 J Street
Sacramento, California 95814-2922

Subject: Reinitiation of Formal Consultation on the Proposed Tule River Spillway Enlargement Project in Tulare County, California

Dear Mr. Ziminske:

This letter is in response to the U.S. Army Corps of Engineers' (Corps) December 19, 2019, request to reinitiate formal consultation with the U.S. Fish and Wildlife Service (Service) on the proposed Tule River Spillway Enlargement Project (proposed project) in Tulare County, California. Your request was received by the Service on December 23, 2019. At issue are proposed project effects to the federally listed as threatened San Joaquin adobe sunburst (*Pseudobahia peirsonii*; sunburst), as well as the federally listed as endangered least Bell's vireo (*Vireo bellii pusillus*; vireo), southwestern willow flycatcher (*Empidonax traillii extimus*; flycatcher), and San Joaquin kit fox (*Vulpes macrotis mutica*; kit fox).

Pursuant to 50 CFR 402.12(j), you submitted a biological assessment for our review and requested concurrence with the findings presented therein. These findings conclude that the proposed project may affect, and is not likely to adversely affect, the vireo and the flycatcher. In addition, the Corps has concluded that the proposed project may affect, and is likely to adversely affect, the sunburst and the kit fox. This response is provided under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act), and in accordance with the implementing regulations pertaining to interagency cooperation (50 CFR 402).

The Corps completed construction of Success Dam in 1961, creating Lake Success along the Tule River. The federal action upon which we are consulting includes all modifications related to the proposed 10 vertical foot raise of the Lake Success gross pool elevation. The increased pool elevation will be produced by widening the Tule River Spillway at Success Dam, which requires relocation of Avenue 146 and a right abutment spillway cut. The Service issued a biological opinion on December 17, 1999 (Service File #1-1-99-F-0085), for the proposed project. The biological opinion addressed effects to the federally-threatened valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*; beetle), giant garter snake (*Thamnophis gigas*), and sunburst, as well as the federally-endangered kit fox.

To date, construction on the proposed Tule River Spillway widening to increase Lake Success pool elevation has not been undertaken. Additionally, the original biological opinion (#1-1-99-F-0085) did not address the currently proposed Avenue 146 relocation and right abutment spillway cut as part of the proposed project description. Furthermore, changes have occurred in the listing status of the species discussed in the original biological opinion. Therefore, the current request for reinitiation is due to the inclusion into the proposed project of the road relocation and right abutment spillway cut, adjustments in proposed project scheduling, and changes in the listed species under consideration.

Since the issuance of the original biological opinion, the population range for the beetle was reevaluated by the Service in 2014, and it is no longer considered to extend into the action area of the proposed project in Tulare County (79 FR 55874). Therefore, the beetle will not be discussed further within this updated biological opinion. The giant garter snake, discussed in the original biological opinion, has not been known to occur along the lower Tule River watershed, or in the Kern Management Unit for giant garter snake recovery. Any alterations in the water regime that may be caused by the proposed project are expected to be intermittent and temporary, and are not expected to extend further downstream or upstream throughout the greater San Joaquin River watershed. Therefore, the giant garter snake will not be discussed further within this current updated biological opinion.

In considering your request, we based our evaluation on the following: (1) the 1999 biological opinion (#1-1-99-F-0085); (2) site visits to Lake Success and Success Dam area on April 2 and April 3, 2019; (3) the reinitiation request and Supplemental Biological Assessment received by the Service on December 23, 2019; (4) e-mail and telephone correspondence between the Service and the Corps; and (5) other information available to the Service.

Least Bell's Vireo

The least Bell's vireo was once a common breeding bird in riparian habitats of California (Grinnell and Miller 1944). Key habitat components of vireo breeding habitat include a dense shrub layer between 3 and 6 feet in height, interspersed with a higher open canopy layer (RHJV 2004). Habitat loss, fragmentation, and the alteration of riparian forest composition and structure have contributed to the decline of breeding vireos (RHJV 2004). Generally, changes in surface water flow patterns throughout the California Central Valley have contributed to the alteration of riparian structure by creating more "old-growth" conditions (dense canopy and open understory) that are unfavorable to breeding vireos (RHJV 2004).

Vireos generally begin breeding in April and May stay until October (Kus 1999). Recent evidence suggests that the riparian woodland habitat in the Tule River delta area upstream of Lake Success serves as suitable breeding habitat for the vireo. Two breeding territories were documented in the area in 2014, both within the currently established gross pool of Success Lake (SSRS 2014). An abandoned nest also was located in the area in 2014. Vireos have been detected in the Tule River delta in 2005, 2010, and 2013 as well (SSRS 2014). No construction activities of the proposed project will be located within riparian cover that may serve as habitat for the vireo. However, the proposed project is designed to maintain an elevated gross pool in Lake Success throughout the early spring months of wetter than normal years, and will inundate the ground of riparian woodlands during these periods.

Vireos have been known to attempt as many as five nests during a breeding season (Service 1998). It is likely that if, for whatever reason, a breeding pair finds a nest site unsuitable, they may make nesting efforts in another area of the breeding territory. It is not likely that any changes in the gross

pool elevation of Lake Success will result in a measurable effect on vireos. Therefore, it is impossible to quantify the effects of such efforts on breeding success.

It is not likely that intermittent changes in the gross pool elevation of Lake Success resulting from the proposed project will affect breeding vireo habitat over time. The proposed project will raise gross pool elevations at times during wet years, but not to an extent that is greater than what is seen under these natural, high-flow conditions. The Corps estimates that some flooding of potentially suitable breeding strata (i.e., shrubs) may occur at roughly a one percent chance each year. Although vireos have been documented in the Tule River delta during the breeding season, higher than normal precipitation and runoff in 2017, for example, kept most of the ground below suitable riparian vireo habitat inundated with the Success Lake gross pool. Although no vireos were known to be in the area in 2017, it is impossible to know if the elevated water levels affected any breeding vireos. However, because the proposed project gross pool elevation is within the natural range of water level fluctuation, the proposed project changes are not expected to cause water inundation to reach a level that would negatively affect the presence of riparian cover that may serve as suitable habitat for the vireo.

After reviewing all of the available information and appropriate avoidance measures, the Service concurs with the Corps' determination that the proposed project may affect, but is not likely to adversely affect, the vireo. The proposed project reached the "may affect" level due to the presence of riparian habitat and the fact that the action area lies within the known historical range of the vireo. However, due to the nature and limited extent of the riparian habitat, timing of construction activities in relation to vireo breeding, and the avoidance of all riparian vegetation during project construction activities, the effects to the vireo are insignificant for the purposes of this consultation.

Southwestern Willow Flycatcher

The southwestern willow flycatcher migrates from areas in Central and South America to arrive in May at breeding grounds in southern California (68 FR 10485). Willow flycatchers tend to establish breeding territories in areas containing open water or saturated soil, interspersed with dense vegetation and open areas. The amount of water present throughout the year in flycatcher territories can vary widely from year to year (Ratliff 1985; Weixleman et al. 1999).

As with the vireo, areas around the spillway where proposed project construction will take place do not contain woody riparian vegetation suitable for breeding flycatchers, yet some areas upstream of Lake Success may serve as breeding habitat. The breeding season typically lasts 3-4 months. Males do exhibit site fidelity, and will return to breeding territories in successive years regardless of standing water conditions at or near territories.

It is not likely that the seasonal changes in the gross pool elevation of Lake Success that may result from the proposed project will affect flycatchers. The flycatcher is known to breed in riparian habitat that is also used by breeding vireos, and therefore the proposed project reached the "may affect" level due to the presence of riparian habitat and the fact that the action area lies within the known historical range of the flycatcher. However, as with the vireo, the proposed project gross pool elevation is expected to cause fluctuations in surface water levels that remain within the natural range that would be seen without any project implementation. Flycatchers are known to breed in territories that exhibit great variability in the amount of standing water that is present during the breeding season (Raitliff 1985; Weixelman et al. 1999). Also, the proposed project changes are not expected to cause water inundation to reach a level that would negatively impact the presence of riparian cover that may serve as suitable habitat for the flycatcher. Therefore, the Services concurs with the Corp's conclusion that the proposed project may affect, but is not likely to adversely affect,

the southwestern willow flycatcher. Any effects to the flycatcher are insignificant for the purposes of this consultation.

The remainder of this document provides our biological opinion on the effects of the proposed project on the sunburst and the kit fox. Critical habitat for the sunburst, vireo, and flycatcher each exists outside of the proposed project area and none will be affected. Critical habitat for the kit fox has not been designated.

Consultation History

June 25, 1998:	The Corps requested formal consultation with the Service for effects on the beetle, snake, sunburst, and kit fox resulting from the proposed Lake Success gross pool elevation raise of 10 feet.
July 30, 1998:	The Service requested additional information regarding the proposed project.
February 19, 1999:	The Corps responded to the Service's request for further information with further details regarding proposed project plans.
September 1999:	The Corps issued a Final Environmental Impact Statement/Final Environmental Impact Report for the Tule River Basin Investigation, which included the proposed 10-foot gross pool elevation raise of Lake Success.
December 17, 1999:	The Service issued a biological opinion on the proposed Lake Success elevation raise. Excluded from analyses in the biological opinion were potential effects due to any public road reconstruction around the west side of Lake Success and any access road reconstruction near the Tule River Spillway.
April 2-3, 2019:	Harry Kahler (Service), Eric Tomasovic (Corps), and Lorena Guerrero (Corps) visited the proposed project action area and surveyed for evidence of listed species, including the San Joaquin adobe sunburst.
July 15, 2019:	The Corps mailed a request to reinitiate consultation for the proposed project, which was received by the Service on July 17, 2019. Included with the reinitiation request was a Supplemental Biological Assessment for the Road Relocation and Right Abutment Spillway Cut for proposed work adjacent to the Tule River Spillway.
September 12, 2019:	Harry Kahler and Jennifer Hobbs (Corps) met with Yari Johnson, Dan Artho, and Nancy Bui (Corps) to discuss the reinitiation, in particular the listed species under consideration and dependent project actions that weren't discussed in the July 15, 2019, reinitiation request. In conclusion, the Corps stated that an updated request for reinitiation would be forthcoming, and it would supersede the July 15, 2019 reinitiation request.
December 23, 2019:	The Service received by mail a reinitiation request from the Corps, dated December 19, 2019, due to modifications in the proposed project and changes in status of federally listed species under consideration. The December 19, 2019, reinitiation request supersedes the Corp's reinitiation request of July 15, 2019.

BIOLOGICAL OPINION

Description of the Action

The Corps has proposed to provide enhanced flood control for the lower Tule River watershed by creating additional water storage capacity at Lake Success in Tulare County, California. Lake Success is formed by Success Dam, located on the main branch of the Tule River about 6 miles upstream and east of Porterville, California. The additional water storage of Lake Success will increase the spillway crest and gross pool elevation from 652.5 feet to 662.5 feet (NAVD88 vertical elevation). The Corps has proposed to increase the gross pool capacity by widening and raising the existing spillway at the north end of Success Dam. Increasing the water storage capacity at Lake Success will allow controlled water releases that do not exceed 3,200 cubic feet per second (cfs) downstream. Releases of 3,200 cfs or more have been known to cause property damage and flooding in areas west of Porterville, where the current Tule River stream capacity is estimated at 1,000 cfs (Corps 2011). The Tule River naturally flows into the historic Tulare Lakebed of the southern San Joaquin Valley. The Tulare Lakebed is presently comprised mainly of agricultural lands.

To raise Lake Success pool capacity, the proposed project involves the construction of a 10-foot high concrete ogee weir across the spillway. Also, the spillway will be widened from a breadth of 200 feet to 365 feet. In 1999, the proposed inundation area was estimated to entail 732 acres, increasing Lake Success capacity from 81,500 acre-feet to 109,500 acre-feet. By 1999 estimates, the proposed project will inundate 659 acres of riparian and upland vegetation, including 71 acres of riparian forest, 421 acres of grassland, and 167 acres of *Atriplex* scrub. Site visits by the Service and the Corps on April 2 and April 3, 2019, indicated that the land cover surrounding Lake Success has not significantly changed since 1999.

Spillway widening will occur by extending the right, or northern abutment. However, because Avenue 146 is currently aligned through the spillway, the Corps is proposing to relocate the road along a right abutment cut above the proposed gross pool. The right abutment cut will require blasting and the staging of excess materials removed by project construction activities. Frazier Dike, which protects properties at the northwestern end of the lake from excessive flooding, will be armored with excess materials stored from earlier project actions. The left, or southern abutment adjacent to the dam will also be armored. Two construction phases have been identified with main components as follows:

Phase 1: Right Abutment Spillway Cut

Avenue 146 Relocation

Temporary Stockpiling of Materials

Start: *July 2020*
Completion: *March 2021*

Phase 2: Spillway Raise

Left Abutment Cut Armoring (as necessary)

Frazier Dike Armoring

Highway 190 Armoring (as necessary)

Recreation Facilities and Utilities Relocations (as necessary)

Increased Lake Success gross pool capacity

Start: *October 2021*
Completion: *May 2023*

Phase 1 Actions

Phase 1 primarily involves the relocation of Avenue 146 out of the existing spillway and onto a right abutment cut. Blasting and removal of earthen materials will be necessary to create the appropriate grade for the road along the abutment cut (Figure 1).

Staging and equipment areas will be established before construction activities begin. One staging area adjacent to the Rocky Hill Recreation Area will contain office trailers, electrical supply lines or generators, security fencing, and other construction related equipment. Three other staging areas will be used for temporary equipment parking and staging, as well as debris stockpiling.

Before construction activities begin, vegetation and surface rocks will be cleared. Once cleared the spillway abutment and road bench will be formed by drilling and blasting. Because low-impact explosives will be used for blasting, noise and ground effects are not expected to extend beyond about 750 feet from each blast site. Three principal sites for blasting are expected along the proposed roadway alignment to create the appropriate slope bench (Figure 2). Debris will be hauled to one of the designated areas for temporary staging, and will be used during future Phase 1 or Phase 2 actions.

The right abutment will be an unlined slope, with rock protection placed as needed. The new Avenue 146 alignment will be a contoured bench located north and west from the proposed extended spillway. Temporarily stored materials removed following blasting procedures will be used as necessary to contour the road grade, as well as the existing lower spillway. Typical road construction vehicles are expected to be used, including graders, loaders, haul trucks, pavement transfer vehicles, and rollers. When completed, the new right spillway abutment will allow a widening of the spillway.

Phase 2 Actions

Phase 2 involves the placement of rock revetments at various locations around Success Lake. Excess blast rock that will be stockpiled from Phase 1 actions will be used to armor Frazier Dike, and the Highway 190 bridge footing and abutment. The Highway 190 bridge footings and abutment are already armored with rock revetment; however, additional rock will be necessary to accommodate the gross pool elevation raise. Likewise, Frazier Dike will require about 3,500 linear feet of added revetment. Additionally, stockpiled blast materials will be used to restore the existing emergency spillway to the original grade and elevation. Work on the existing emergency spillway is necessary due to a flood event in December 1966, which altered a portion of the emergency spillway.

Figure 1. Proposed action area for Phase 1 of the Tule River Spillway Enlargement Project at Lake Success in Tulare County, California (Corps 2019).

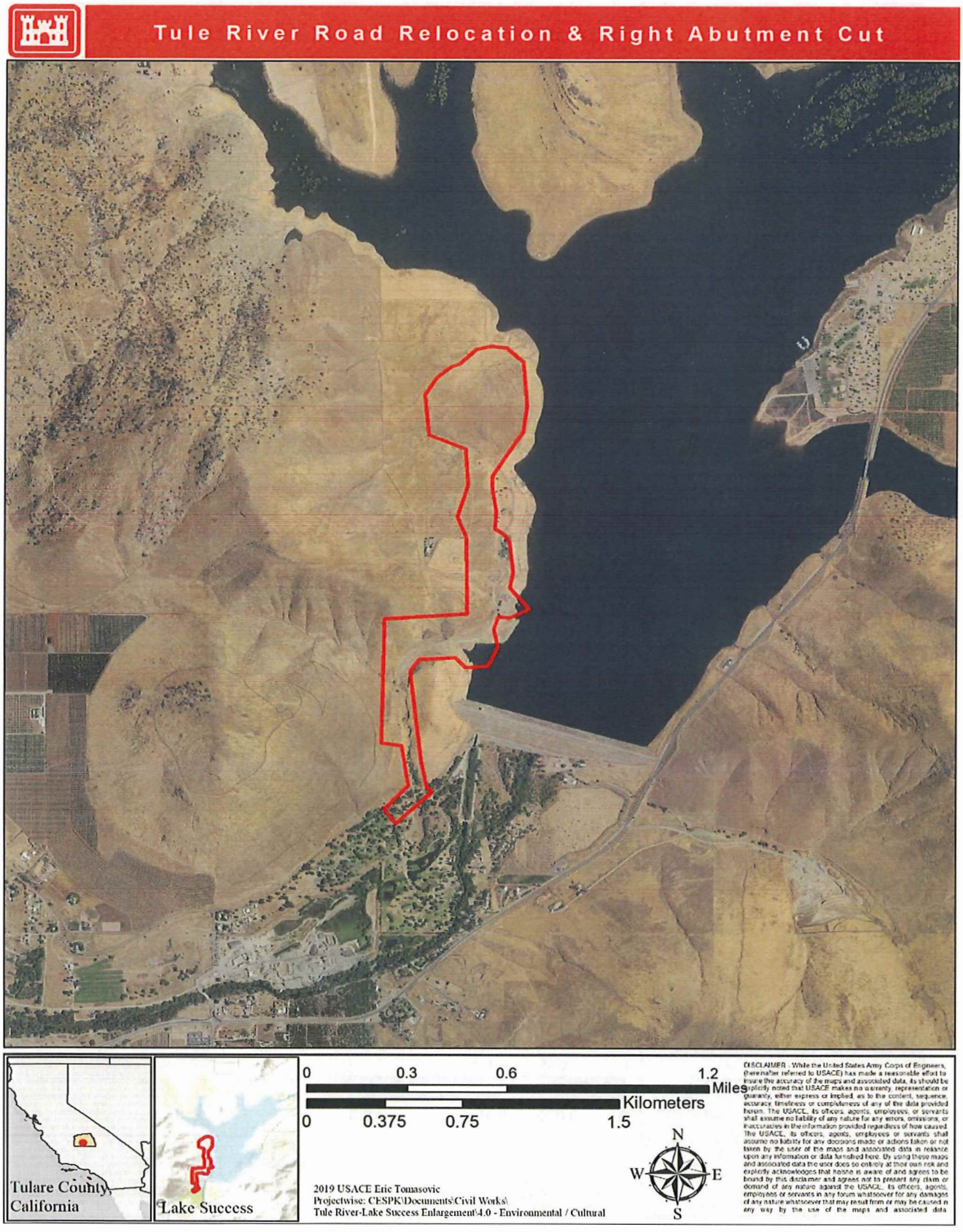
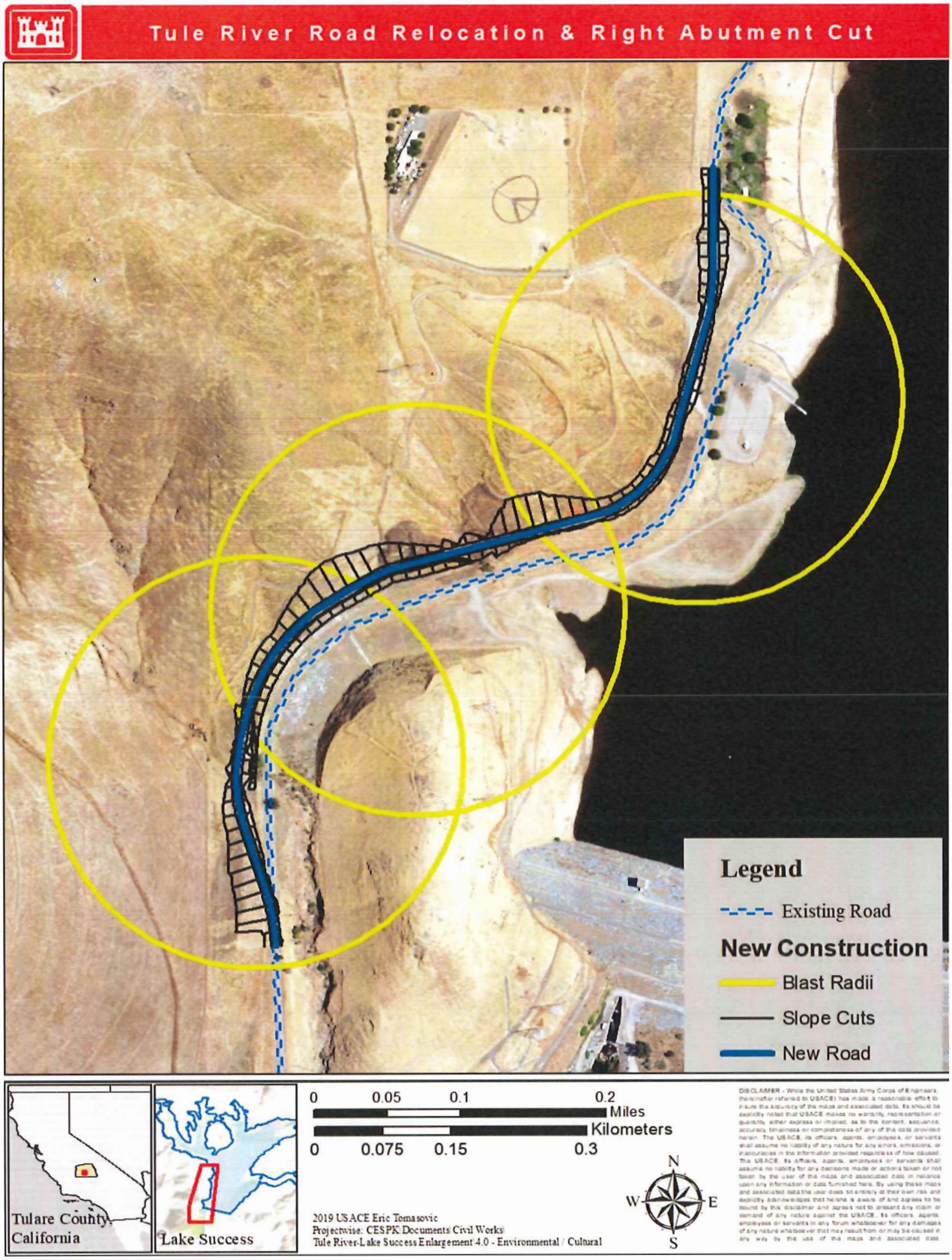


Figure 2. Proposed blasting sites and new road alignment of Avenue 146 as per Phase 1 of the Tule River Spillway Enlargement Project at Lake Success in Tulare County, California (Corps 2019).



A second major activity of Phase 2 is the creation of a 10-foot high concrete ogee weir across the spillway. After the Phase 1 construction is complete, the existing spillway will be widened from 200 feet to 365 feet in the region adjacent to the lakebed. The ogee weir will be constructed near the upstream end of the spillway. Access will be from Avenue 146. The rest of the widened spillway will be maintained much as it is now, as an area of sparse herbaceous vegetation.

The goal of the proposed project is to increase the storage capacity of Lake Success during spring high-water events. To accommodate the potential increase in pool elevation, a number of lakeside facilities and appurtenances will require relocation or flood-proofing. The facilities and appurtenances are largely associated with the Tule and Rocky Hill Recreation Areas, which are located to the east and west of the dam and spillway, respectively. Along the eastern shore of Lake Success, the Tule Recreation Area boat ramp will require lengthening and widening. An earthen protective berm will built around the existing Tule Recreation Area water tank and well. Also, the restroom facilities at the Tule Recreation Area will require similar water-proofing to safeguard against flooding and contamination.

Restroom facilities at the Rocky Hill Recreation Area on the western shore will require similar water-proofing actions. Similarly, the parking will be extended upland to account for the losses resulting from the new gross pool elevation. Unlike the Tule storage tank and well, the Rocky Hill storage tank, well structures, and associated shed will be moved to higher ground.

Another aspect of Phase 2 work involves the relocation of 14 transmission towers. The towers will be moved, along with 11,800 feet of electric supply lines, to meet minimum clearance criteria above the new gross pool elevation.

When construction and related actions are complete, the Success Lake and Dam water control manual will be updated to reflect the change in flood storage capacity for the lake.

Conservation Measures

The Corps has proposed to implement the following measures as part of the proposed Phase 1 project:

- Prior to construction, an employee education program will be conducted consisting of a brief presentation of San Joaquin kit fox, San Joaquin adobe sunburst, and migratory birds by persons knowledgeable in biology and legislative protection. The program will include the occurrence of each federally listed species in the area, its description and life history, and an explanation of the species status and protection under the Act.

- During construction activities, if dead, injured, or entrapped animals or new plots of federally listed plants are found in the work area, the Service will be contacted immediately immediately for further guidance if such a discovery is found.

- All construction pipes, culverts, or similar structures with a diameter of 4 inches or greater that are stored at a construction site overnight will be thoroughly inspected for kit foxes before the pipe or structure is used or moved. If a kit fox is discovered, the containing equipment will not be moved until the Service is contacted for further guidance.

- Project-related vehicles will observe a daytime speed limit of 15-mph and a nighttime speed limit of 10-mph throughout the site in all project areas, except on county roads and State and Federal highways.

- Night-time construction will be minimized to the extent possible. Off-road traffic, outside of designated project areas, will be prohibited.

- Stormwater runoff will be controlled using standard construction measures and equipment (straw wattle, silt fencing, etc.).

- All food-related trash items such as wrappers, cans, bottles, and food scraps will be disposed of in securely closed containers, and removed daily from a construction or project site.

- No firearms will be allowed on the project site.

- No pets, such as dogs or cats, will be permitted on the project site to prevent harassment, mortality, or destruction of dens or burrows.

- To prevent inadvertent entrapment of kit foxes, or other animals, during the construction phase of a project, all excavated, steep-walled holes or trenches more than 2-feet deep will be covered at the close of each working day by plywood or similar materials. If the trenches cannot be closed, one or more escape ramps constructed of earthen-fill or wooden planks will be installed. Similarly, all culverts or similar construction structures with a diameter of 4-inches or greater that are stored at a construction site for one or more overnight periods will be thoroughly inspected for kit foxes before the pipe is subsequently buried, capped, or otherwise used or moved in any way. Before such holes or structures are filled or moved, they will be thoroughly inspected for trapped animals. If at any time a trapped or injured animal is discovered, the Service will be contacted for further instruction.

- Escape ramps or structures will be installed immediately to allow the trapped animals to escape holes or enclosed structures. If animals remain trapped, the Service will be contacted for guidance.

- Use of rodenticides and herbicides in project areas will be restricted. All uses of such compounds will observe label and other restrictions mandated by the U.S. Environmental Protection Agency, California Department of Food and Agriculture, and other state and federal legislation, as well as additional project-related restrictions deemed necessary by the Service. If rodent control must be conducted, zinc phosphide will be used to minimize risk to kit fox.

- A Corps botanist will conduct pre-construction surveys within the construction footprint during peak-flower, based on bloom times of known populations in the area, to ensure that no San Joaquin adobe sunburst are present. If the species is present, the Corps will undertake the following mitigation measures:

    - as possible, avoid plants and erect a 25-foot buffer using exclusionary fencing;

    - if avoidance is not practical, plants will be hand dug and transplanted outside the construction footprint under the guidance of a qualified botanist or restoration ecologist;

    - transplanted plant locations will first be chosen with a preference for having existing San Joaquin adobe sunburst plants, second, former known adobe sunburst location, and third, an area with similar slope, aspect and soils;

- in addition to transplanting, topsoil will be collected in a 6-foot buffer around the plants to help secure the seedbank;
- collected topsoil will be placed in 6 to 12-inch wide, circular, shallow pits near the transplanted plants;
- during Phase 1 & 2 construction, transplanted plants will be monitored by a qualified biologist during each growing season via flower counts, percent cover, and stem length measurements; and
- an annual monitoring report will be submitted to the Service each November until 1 year after construction is complete. Any existing San Joaquin adobe sunburst plants located near the construction footprint will be protected with exclusionary fencing for the duration of the project.

- A Service-approved kit fox biologist will conduct pre-activity surveys for kit fox presence within 30 days, and to the extent practicable, within 14 days of construction initiation using methodologies acceptable to the Service. Surveys will cover all areas potentially affected by ground disturbing activities associated with the project, including vehicle travel and staging.

Action Area

The action area is defined in 50 CFR § 402.02, as "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action." For the proposed project, the action area includes all areas surrounding the current Lake Success pool elevation that will become inundated with water due to 10-foot increase in the gross pool elevation. Downstream of Success Dam, the action area also includes all areas that will be affected by changes in water regimes resulting from increased water storage in Lake Success. Related activities are also part of the action area, such as Phase 1 construction, Frazier Weir reinforcement, left abutment cut construction, all stockpiling and staging areas, and vehicle travel routes. With blasting, Phase 1 construction will affect an area of about 193 acres. Phase 2 work will largely occur within the existing spillway, recreation areas, and existing powerline right of way. In all, proposed project work is estimated to affect about 225 acres. Downstream of the dam, proposed project work is also expected to temporarily affect an indeterminable amount of land, largely riparian and agricultural, that would otherwise be subject 100-year flood events.

Analytical Framework for the Jeopardy Determination

The following analyses rely on four components to support a jeopardy determination for the San Joaquin adobe sunburst and San Joaquin kit fox: (1) the *Status of the Species*, which evaluates the species' range wide condition, the factors responsible for that condition, and their survival and recovery needs; (2) the *Environmental Baseline*, which evaluates the condition of these species in the action area, the factors responsible for that condition, and the role of the action area in the species' survival and recovery; (3) the *Effects of the Action*, which determines the direct and indirect effects of the proposed federal action and the effects of any interrelated or interdependent activities on these species; and (4) *Cumulative Effects*, which evaluates the effects of future, non-federal activities in the action area on these species.

In accordance with the implementing regulations for section 7 and Service policy, the jeopardy determination is made in the following manner: the effects of the proposed federal action are evaluated in the context of the aggregate effects of all factors that have contributed to the current

status of the species. Additionally, for non-federal activities in the action area, we will evaluate those actions likely to affect the species in the future, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both its survival and recovery in the wild.

The following analysis places an emphasis on using the range-wide survival and recovery needs of the sunburst and the kit fox, and the role of the action area in providing for those needs as the context for evaluating the significance of the effects of the proposed federal action, taken together with cumulative effects, for purposes of making the jeopardy determination. Every component of each proposed project phase in considered in the jeopardy determination.

Status of the Species

San Joaquin Kit Fox

Please refer to the San Joaquin Kit Fox (*Vulpes macrotis mutica*) 5-Year Review: Summary and Evaluation (Service 2010) for the most recent comprehensive assessment of the range-wide status of the kit fox. The 5-year review did not recommend a change in the listing status of the species. The threats evaluated during that review and discussed in the final document have continued to act on the species since the 2010 5-year review was finalized, with degradation or outright loss of habitat being the most significant effects. While there have been continued losses of kit fox habitat throughout the various recovery units, to date no project has proposed a level of effects for which the Service has issued a biological opinion of jeopardy for the species. The Service is in the process of finalizing its most current 5-year review for the kit fox.

San Joaquin Adobe Sunburst

Please refer to the *Pseudobahia bahiifolia* (Hartweg's golden sunburst), *Pseudobahia peirsonii* (San Joaquin adobe sunburst) 5-Year Review: Summary and Evaluation (Service 2007) for the most recent comprehensive assessment of the range-wide status of the sunburst. The 5-year review did not recommend a change in the listing status of the species. Threats acting upon the sunburst include residential development, agricultural conversion, flooding, overgrazing, invasive plants, road and utility line work, and drought. The threats evaluated during the review and discussed in the final document have continued to act on the species since the 2007 5-year review was finalized. While there have been continued losses of sunburst habitat throughout the various recovery units, to date no project has proposed a level of effects for which the Service has issued a biological opinion of jeopardy for the species. The Service is in the process of finalizing its most current 5-year review for the sunburst.

Environmental Baseline

San Joaquin Kit Fox

The kit fox is predominantly an inhabitant of the San Joaquin Valley (Service 1998). However, kit foxes will occasionally use bordering foothill areas for foraging and as a movement corridor. Eleven documented occurrences of the kit fox have been reported within 10 miles of Lake Success (CNDDB 2020). The most recent documented occurrence is from 1992, and no occurrence is within 5.0 miles of Lakes Success and the lower Tule River.

Most kit fox dens are known to occur in areas of 40% slope or less (Service 1998). The topography of the action area is suitable for denning. Although kit foxes have not been identified near Lake

Success, potential den sites have been found throughout the area. Numerous ground squirrel and rabbit holes were found by the Corps during surveys in April 2019. An active den was found near right spillway abutment during surveys by the Corps on February 5, 2019, yet it could not be determined what species was using the den. It is not always obvious that a den is in use by a kit fox, yet natal denning sites typically demonstrate more evidence of use (Service 1998). In all, most surface soils in the Lake Success region are too shallow to support suitable kit fox den sites, which are typically 4 to 10 feet below surface level (Morrell 1972; O'Neal et al. 1987).

Kit foxes are nocturnal, and remain active throughout the year (Morell 1972). Kit foxes will typically use a den for 2 to 3 days, but kit foxes of the southern and central San Joaquin Valley regions are known to travel an average of 9.6 miles in one night (Service 1998). Avoidance of coyotes or dogs, and the buildup of parasites in den sites, are the principal reasons kit foxes will change dens (Service 1998). In all, evidence suggests that kit fox could use the Lake Success area primarily for foraging and movement, but likely denning and breeding would occur rarely, if at all.

San Joaquin Adobe Sunburst

The species range of the sunburst is grasslands of the Sierra Nevada foothills of Fresno, Kern, and Tulare Counties, and reported to be restricted to four soils series: Cibo clay, Porterville clay, Centerville clay, and Mt. Olive clay (Vollmar Consulting 2010). Soils to the north and west of Lake Success are mainly Centreville clay, Porterville clay, and Cibo clay (NRCS 2020), indicating prime habitat for the sunburst in the proposed project action area.

In fact, several occurrence records of sunburst have been documented in the area around Lake Success (CNDDB 2020). Since the recognition of the sunburst in the Lake Success area, the number of plants has been known to vary from 0 to over 300 individuals (CNDDB 2020). Moreover, in addition to the documented occurrences, two additional undocumented sites of sunburst were found by Corps and Service staff in April, 2019, when surveying around the proposed gross pool elevation near Frazier Dike and to the north of the upstream riparian area. Documented occurrences 10, 19, and 46 lie within the temporary work area of Phase 1. Also, two of the known occurrences of sunburst could be affected by increased water levels resulting from proposed project implementation.

Effects of the Action

San Joaquin Kit Fox

Phase 1 and Phase 2 construction will remove and disturb potential denning and foraging habitat for the kit fox. Notably, blasting activities associated with Phase 1 would affect any kit foxes that may be unseen but within the blast radii. Likewise, the movement of heavy equipment for road construction and the storage of construction debris could also affect kit foxes. Similar effects could result from the relocation buildings, and power line towers, along with the placement of rock enforcements as part of Phase 2.

Foraging habitat will be temporarily lost during both construction phases. While outright foraging habitat loss is not expected, the relocation of Avenue 146, power line towers, and other recreational area buildings will prevent kit foxes from foraging in these areas until construction is complete. Additionally, potential changes in Tule River water levels as a result of the proposed project, both above and below the Success Dam, may temporarily remove foraging habitat for the kit fox. Lake Success water levels will rise about 10 feet during certain flood events. Based on the Corp's hydraulic modeling, there is a one percent chance each year that the proposed maximum lake level

will be reached (Corps 2019). No permanent effects to downstream habitat are expected, and the average change in water level during flood events across the Tulare Lakebed will be a reduction of 0.001 inches (Corps 2019).

The presence of active kit fox dens in the action area is possible, yet no known active dens have been detected. One active den was discovered by the spillway in 2019, yet the species of the animal using the den could not be verified. Although foraging is possible, it's not likely that kit fox breeding would be occurring in the proposed project action area. Natal kit fox dens generally have two entrances, and sometimes a mound associated with the burrows (Service 1998). No such structures were found during 2019 surveys. Any proposed project effects are likely to be experienced by kit foxes that are foraging and may be using construction areas for denning during project activities.

San Joaquin Adobe Sunburst

Four documented occurrences of the sunburst exist around Lake Success, while two additional occurrences were found during surveys in 2019. The sunburst is an annual species, and individual numbers within occurrences varies naturally from year to year. Downstream from Lake Success, the San Joaquin Valley is outside of the range of the sunburst.

The action area for Phase 1 intersects with outlined boundaries for three occurrences of the sunburst (CNDDB 2020). Occurrence 19, most recently and accurately mapped in 2006, occurs at the northern end of the Phase 1 proposed project action area. The storage of bedrock materials could preclude the growth and development of some sunburst plants, more so if any materials are left after the project is complete. However, the stockpiling of materials has been moved by the Corps away from the noted occurrence.

The outlined boundary of Occurrence 46 near the spillway will be affected by road relocation activities. To accommodate a wider spillway, a new Avenue 146 alignment will need to traverse an area where the sunburst has been known to occur. However, soils of the area are predominantly a Las Posas – Rock complex (NRCS 2020), not known to support sunburst assemblages. Since 2010, several surveys have been conducted and the sunburst was found in only 2014. That year, 21 individuals were noted at Occurrence 46, adjacent to the existing Avenue 146 alignment. Related plants in the tarweed tribe, which includes all sunbursts, remain viable in the seedbank for up to 5 years (Montalvo et al. 2010). The absence of sunburst in the area during most survey years could be a result of increased grazing activity and less-than-optimal soil conditions. Although it is impossible to determine definitively, the presence of sunburst in the area could have been a result of soil movement along Avenue 146 from the nearby Cibo clay topsoil to the north.

The outlined Phase 1 action area also bisects Occurrence 10, which occurs in the same Las Posas – Rock complex as Occurrence 46. Occurrence 10 occurs along a dirt track for local ranching activities, uphill to the west of Avenue 146. Like Occurrence 46, the area may be subject to soil disturbance and movement along the track. The soil under Occurrence 10 is not likely to be altered by construction directly, although the slope cuts for the new avenue alignment will be about 200 feet downhill of the occurrence. The new sloping could affect the local hydrology within the occurrence area, which could affect the presence of sunburst. In the past 10 years, 40 individuals were discovered at occurrence 10 in 2010, while 10 were discovered in 2016.

After the proposed project construction is complete, the Corps estimates Occurrence 19 could be affected by flood events about once every 10 years, while the newly discovered occurrence by Frazier Dike could be affected once every 100 years (Corps 2019). Inundation could slow growth

during subsequent spring and summer months, which in turn could negatively affect seed production.

Cumulative Effects

Cumulative effects include the effects of future state, tribal, county, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. The Tule River Tribe of California owns about 80 acres along Highway 190 in the Sierra Nevada foothills, in the area of Lake Success. The Tule River Tribe also owns 40 acres in the Porterville Airport Industrial Park, where tribal plans include the construction of a casino. The Porterville Airport Industrial Park in the San Joaquin Valley is not within the proposed project action area, and casino construction is expected to have no related effect to the proposed project. There are no known plans for tribal projects along Highway 190 in the Sierra Nevada foothills. No other state, county, local, or private actions are known that are reasonably certain to occur.

Conclusion

After reviewing the current status of the San Joaquin kit fox, the environmental baseline for the action area, the effects of the proposed project, and the cumulative effects, it is the Service's biological opinion that the Tule River Spillway Enlargement Project, as proposed, is not likely to jeopardize the continued existence of the kit fox. The Service reached this conclusion because the project-related effects to the species; when added to the environmental baseline and analyzed in consideration of all potential cumulative effects, will not rise to the level of precluding recovery or reducing the likelihood of survival of the species.

After reviewing the current status of the proposed critical habitat for the San Joaquin adobe sunburst, the environmental baseline for the action area, the effects of the proposed project, and the cumulative effects, it is the Service's biological opinion that the Tule River Spillway Enlargement Project, as proposed, is not likely to jeopardize the continued existence of the sunburst. The Service reached this conclusion because the project-related effects to the species, when added to the environmental baseline and analyzed in consideration of all potential cumulative effects, will not rise to the level of precluding recovery or reducing the likelihood of survival of the species.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Harass is defined by Service regulations at 50 CFR 17.3 as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the same regulations as an act which actually kills or injures wildlife. Harm is further defined to include significant habitat modification or degradation that results in death or injury to species by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(40 and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

Sections 7(b)(4) and 7(o)(2) of the Act do not apply to listed plant species. However, protection of listed plants is provided to the extent that the Act requires a federal permit for removal or reduction to possession of endangered and threatened plants from areas under federal jurisdiction, or for any act that would remove, cut, dig up, damage, or destroy any such species on any other area in knowing violation of any regulation of any State or in the course of any violation of a state criminal trespass law.

The measures described below are non-discretionary, and must be undertaken by the Corps so that they become binding conditions of any contract for the exemption in section 7(o)(2) to apply. The Corps has a continuing duty to regulate the activity covered by this incidental take statement. If the Corps (1) fails to assume and implement the terms and conditions or (2) fails to require the local sponsor to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the operations and maintenance manual, the protective coverage of section 7(o)(2) may lapse.

Amount or Extent of Take

San Joaquin Kit Fox

The Service anticipates that incidental take of kit fox will be difficult to detect due to its life history and ecology. Specifically, the kit fox is chiefly nocturnal, and can be difficult to locate due to the fact that during working, daylight hours the kit fox will likely be denning and not visible. The relatively small size and cryptic coloration will also contribute to the potential of individual kit foxes being overlooked during project activities. There is a risk of harm, harassment, injury and mortality as a result of the proposed construction around the potential den site identified during 2019 site visits. It is not likely that any kit fox in the identified den, or any other unforeseen den site in the Lake Success construction area, will be using the site for breeding or rearing. However, the Service is authorizing take incidental to the proposed action as harm, harassment, injury, and mortality of one San Joaquin kit fox as a result of project-related construction.

Effect of the Take

In the accompanying biological opinion, the Service has determined that the level of anticipated take resulting from proposed project completion (i.e., completion of Phase 1 and Phase 2 work), is not likely to result in jeopardy to the kit fox or sunburst; or destruction or adverse modification of critical habitat.

Reasonable and Prudent Measures

All necessary and appropriate measures to avoid or minimize effects on the kit fox and sunburst resulting from implementation of this project have been incorporated into the project's proposed conservation measures. This Reasonable and Prudent Measure shall be supplemented by the Terms and Conditions below.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the Corps must ensure compliance with the following terms and conditions, which implement the reasonable and prudent measure described above. These terms and conditions are nondiscretionary.

1. The Corps shall include full implementation and adherence to the conservation measures as a condition of any contract issued for the project and in the operations and maintenance manual.

2. In order to monitor whether the amount or extent of incidental take anticipated from implementation of the project is approached or exceeded, the Corps shall adhere to the following reporting requirements. Should this anticipated amount or extent of incidental take be exceeded, the Corps must immediately reinitiate formal consultation as per 50 CFR 402.16.

   (a) For those components of the action that may result in direct encounters between listed species and project workers and their equipment whereby incidental take in the form of harassment, harm, injury, or death is anticipated, the Corps shall immediately contact the Sacramento Fish and Wildlife Office (SFWO) at (916) 414-6600 to report the encounter. If the encounter occurs after normal working hours, the Corps shall contact the SFWO at the earliest possible opportunity the next working day.

   (b) To better understand the relationship between the San Joaquin adobe sunburst and proposed project activities, during construction and 3 years post-construction the Corps will perform at least one annual survey during March or April for the San Joaquin adobe sunburst where the action area overlaps potential sunburst habitat. If plants are found, the Corps shall inform the SFWO immediately to determine if further beneficial conservation measures can be undertaken to protect the species. The Corps will provide annual survey reports to the Service describing survey methodology and results.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The Service recommends the following actions:

1) The Corps will coordinate with the SFWO to develop an operations and maintenance plan that continues to benefit the conservation of San Joaquin adobe sunburst on public lands in the Lake Success area.

2) The Corps should provide funding for long-term monitoring of the San Joaquin adobe sunburst to increase the understanding of ecological conditions that are beneficial to sunburst.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION—CLOSING STATEMENT

This concludes formal consultation on the proposed Tule River Spillway Enlargement Project. As provided in 50 CFR §402.16, reinitiation of formal consultation is required and shall be requested by the federal agency or by the Service where discretionary federal agency involvement or control over the action has been retained or is authorized by law and:

(a) If the amount or extent of taking specified in the incidental take statement is exceeded;

(b) If new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered;

(c) If the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion; or

(d) If a new species is listed or critical habitat designated that may be affected by the identified action.

If you have any questions regarding this biological opinion, please contact Harry Kahler, Fish and Wildlife Biologist, (harry_kahler@fws.gov) at (916) 414-6577 or at the letterhead address.

Sincerely,

Doug Weinrich

Jennifer M. Norris, Ph.D.
Field Supervisor

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APPENDIX F - LIST OF INTERESTED PARTIES CONTACTED

Type	Name	Position	Org/Company
State	Sharri Bender Ehlert	District 6 Director	Caltrans
State	Department of Parks & Recreation		State of California
State	Devon J. Mathis	Assemblyman	CA 26th State Assembly District
State	Melissa Hurtado	Senator	CA 14th State Senate District
State	Wildlife Conservation Board c/o CDFW		State of California
State	Department of Fish & Wildlife		State of California
State	District 4 Office		Department of Fish & Wildlife
State	Office of Historic Preservation		State of California
State	Central Valley Region, Fresno Branch Office		California Regional Water Quality Control Board
State	Central Valley Flood Protection Board		State of California
State	Department of Water Resources		State of California
State	Water Resources Control Board		State of California
State	Natural Resources Agency		State of California
State	State Clearinghouse		State of California
State	Public Utilities Commission		State of California
State	Department of Housing and Community Development		State of California
State	Kenneth Foster	Southern California Region	State Lands Commission
State	Department of Public Health		State of California
Tribe	Robert Robinson		Kern Valley Indian Council
Tribe	Rueben Barrios Sr.		Santa Rosa Rancheria Tachi Yokut Tribe
Tribe	Robert L. Gomez, Jr		Tubatulabals of Kern Valley
Tribe	Neil Peyron		Tule River Indian Tribe
Tribe	Kenneth Woodrow		Wuksache Indian Tribe/Eshom Valley Band
Federal	Kevin McCarthy	Congressman	CA 23rd Congressional District
Federal	Dianne Feinstein	Senator	CA 116th US Congress
Federal	Kamala Harris	Senator	CA 116th US Congress
Federal	Alessandro Amaglio	Environmental Officer	FEMA Region IX
Federal	Charlie Mauldin		Lake Success USACE Park Headquarters

Type	Name	Position	Org/Company
Federal	Natural Resources Conservation Service		US Department of Agriculture
Federal	Harry Kahler	Fish & Wildlife Biologist	US Fish and Wildlife Service
Federal	Supervisors Office		Sequoia National Forest
Federal	Advisory Council on Historic Preservation		United States of America
Landowner	Tulare County		
Landowner	William Ballow		
Landowner	Dan and Janice Weisenberger		
Landowner	Four Corners Inc		
Landowner	Dennis Franks		
Landowner	Daylene Gill Stout		
Landowner	Keith A Blevins		
Landowner	Ryan and Melissa Ruckman		
Landowner	Ronal Lance Lorna Jean Kirkland		
Landowner	Khamphet Silaso		
Landowner	Evita Diaz Santiago Oseguera		
Landowner	Beverly J Weisenberger		
Landowner	Gary and Sheri Babcock		
Landowner	Kelly and Jennifer Jeffries		
Landowner	David Coy		
Landowner	Lonnie and Shauna Mcallister		
Landowner	Denis and Marcia Doran		
Landowner	Louis Brent and Sharon Gill		
Landowner	Jake Platt LLC		
Landowner	Joy Collier		
Landowner	Paul G Hankins		
Landowner	Hester Family Limited Partnership		
Landowner	Gill Cove LLC		
Landowner	Russell L Davis		
Landowner	Brett and Danielle Nixon		
Landowner	*Martin Hamilton*		*Returned to Sender, unable to forward*
Landowner	*Raymond Anderson & Karyn Stevens*		*Returned to Sender, unable to forward*

Type	Name	Position	Org/Company
Landowner	Sheri Palos		
Landowner	Edith F Peterson		
Landowner	Rocky Hill Cove LP		
Library	Porterville Public Library		City of Porterville
Library	Springville Branch Library		Tulare County Library
Library	Strathmore Branch Library		Tulare County Library
Local	John D. Lollis	City Manager	City of Porterville
Local	Dan Vink		Lower Tule River Irrigation District
Local			Porterville Irrigation District
Local	Valarie Ballard	Southern Region Compliance Manager	San Joaquin Valley Air Pollution Control District, Southern Region Office
Local			Springville Chamber of Commerce
Local	Long Range Planning Division		Tulare County Resource Management Agency
Local	Current Planning Division		Tulare County Resource Management Agency
Local	Parks and Recreation Division		Tulare County Resource Management Agency
Local	Tulare County Flood Control District		Tulare County Resource Management Agency
Local	Dennis Townsend	District 5 Chairman	Tulare County Board of Supervisors
Local	Mark A. Gilkey	General Manager	Tulare Lake Basin Water Storage District
Local			Porter Vista Public Utility District
Local			Southern California Edison
Local	Fire Warden		California Department of Forestry
Local	Porterville Substation		Sheriff's Department
Local	John Avila	General Manager	Tulare Mosquito Abatement District
Local	Bill Parsons	Publisher	The Porterville Recorder
Local	Reggie Ellis	Publisher	The Sun-Gazette Newspaper
NGO	Daniel Gluesenkamp	Executive Director	California Native Plant Society
NGO			Tule River Association
NGO			Tulare County Audubon Society
NGO			Tule River Parkway Association
NGO	National Headquarters		Sierra Club
NGO	State of California Program		The Nature Conservancy