# LOW-IMPACT HYDROPOWER POWER INSTITUTE CERTIFICATION APPLICATION

Folsom and Nimbus Hydroelectric Projects, Folsom CA (FERC non-jurisdictional)

January 2021

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#### **1.0 FACILITY DESCRIPTION**

Folsom and Nimbus hydroelectric projects are located on the American River in California and are part of the Central Valley Project (CVP), a federal water management project supervised by the US Bureau of Reclamation (Reclamation). The American River is part of the Sacramento River Basin. The Basin covers 27,210 square miles and includes the entire area drained by the Sacramento River. The principal streams are the Sacramento River and its larger tributaries: the Pit, Feather, Yuba, Bear, and American Rivers to the east; and Cottonwood, Stony, Cache, and Putah Creeks to the west. Major reservoirs and lakes include Shasta, Oroville, Folsom, Clear Lake, and Lake Berryessa (Figure 1).

#### Background

Hydraulic mining in the region began in 1855 and continued until 1884. This has been called the greatest transfer of earth in human history. Hydraulic mining created massive erosion in the foothills and sedimentation in the Central Valley. Flooding of the City of Sacramento worsened as river channels filled with sediment, killing fish, and raising the level of sediment in San Francisco Bay. This flooding and environmental harm caused by hydraulic mining preceded, and were major drivers for, the building of Folsom Dam.

The Sacramento River Flood Control Project is complemented by the CVP, a system of dams and reservoirs that extend 500 miles southward from the Cascade Mountains and stretches 100 miles from the foothills of the Sierra to the coastal mountain ranges. The CVP is a system by which water is stored and distributed throughout the Central Valley. The CVP also generates hydroelectric power. The primary components of the CVP are a series of multi-purpose dams and reservoirs in the foothills which collects winter rains and spring runoff for use in the summer and the fall. These reservoirs are also connected to the existing flood control system. They are used during the flood control season to provide storage space for the runoff that is generated by large flood events, in addition they provide water supply, recreation, and power. The CVP stores and transports surplus water from the American, Sacramento, San Joaquin, Stanislaus, and Trinity River Basins in northern and central California, and that water is used primarily for irrigation in the Central Valley. From the perspective of residents in the Sacramento area, the most prominent feature of the CVP is the Folsom Dam and Reservoir.

The Flood Control Act of 1936 formally authorized funds for the CVP. A 1940 statute broadened the project's purpose to include navigation improvements, flood control, and energy development purposes. A1949 statute reauthorized the CVP to include the Folsom dam and reservoir. A 1950 statute again reauthorized the Central Valley project and declared the purpose of the project to be for improving navigation, regulating the flow of the San Joaquin and Sacramento Rivers, flood control, irrigation, and electric power. Public Law 674, enacted in 1954, declared use of water for fish and wildlife as a project purpose in addition to all other previously stated purposes. It also provided authority and conditions for delivery of water to the Grasslands areas of the San Joaquin Valley for waterfowl purposes as stipulated in the 1950 DOI report entitled "Waterfowl Conservation in the Lower San Joaquin Valley, Its Relationship to the Grasslands and the Central Valley Project."

Public Law 95-616, approved November 8, 1978, amended the 1954 Act to guarantee the delivery of 3000 acre-feet of water each fall and 4000 acre-feet of water each summer, when available, and authorized construction of the water delivery system to deliver water to Federal waterfowl refuges in the San Joaquin Valley.

The <u>Central Valley Project Improvement Act (CVPIA) of 1992</u> included provisions to protect, restore, and enhance fish and wildlife and their habitats in the Central Valley and Trinity River basins. The CVPIA was developed after recognition of the environmental damage caused by such a large infrastructure project including decades of declining fish populations, severe pollution, groundwater contamination and flooding of historic archeological sites. Objectives include addressing the impacts of the CVP on fish and wildlife resources and achieving a "reasonable balance among competing" water uses. As a result, 800,000 acre-feet per year is dedicated to fish and wildlife and their habitat including 410,000 acre-feet going to State and Federal wildlife refuges and wetlands.

By the early 1990s, the Sacramento region had suffered 30 years of contentious battle over the American River with local governments, water purveyors, environmentalists, and other stakeholders stating competing and conflicting claims on the river and its resources. The last two California droughts brought the region water supply cutbacks and environmental degradation. Compounding these problems was a water table that had been lowered in some areas by as much as 90 feet due to groundwater overdraft. Moreover, parts of the area's groundwater basins had become unusable due to contamination. Adding to water supply concerns was an increasing awareness of the fragility of the aquatic ecosystem of the lower American River.

With water demand growing alongside population and growing concern for the environment, area leaders recognized that balancing the complex and often conflicting needs of water demand and environmental needs required input from multiple stakeholders to comprehensively address the region's water woes. In 1993, the City and County of Sacramento created the Water Forum to find solutions to the water dilemma. The Water Forum provided a safe place for water interests to voluntarily work together to meet their mutual water needs. Following seven years of interest-based negotiations, where members looked beyond demands or historic positions and focused on underlying interests, the <u>Water Forum Agreement</u> was signed in 2000 by 40 stakeholder organizations.

## The Projects

The Folsom project is a 198.72 MW hydroelectric facility with three 76 MW Francis units located at the outlet of Folsom Lake located at the confluence of the North and South Forks of the American River, or at approximate river mile 30 on the American River above its confluence with the Sacramento River. Construction of the Folsom Powerplant began in June 1951 and was completed in 1955. The dam plus the earthfill auxiliary Mormon Island Saddle Dam and eight other earthfill dikes create Folsom Lake. The dam regulates flows of the American River for irrigation, power, flood control, municipal and industrial use, fish and wildlife, recreation, and other purposes.

The Nimbus project is a 15.53 MW facility with two 7.763 MW turbine units. The dam forms Lake Natoma, located at approximate river mile 23 on the American River above its confluence with the Sacramento River. Construction occurred from 1952 to 1955 and the project began operating in 1955. The project includes a fish hatchery and visitor center. There are no dams downstream of Nimbus Dam and the river is unrestricted to the Bay Delta, allowing fish passage between Nimbus dam and the Pacific Ocean. Nimbus reregulates the releases for power made through the Folsom powerplant, and it serves as a diversion dam for the Folsom South Canal used for irrigation, industrial and municipal water supply. Formerly the canal provided cooling water for the Rancho Seco Nuclear Generating Station. It is also connected to the Mokelumne Aqueduct, which provides a large portion of the San Francisco Bay Area's water supply.

Folsom is operated as a peaking plant in concert with the downstream regulating reservoir and Nimbus facility is operated in a run-of-river mode such that hydropower operations do not affect river flow. Hydroelectric generation from Folsom and Nimbus Powerplants does not determine or influence American River flows. Rather, the generation schedule is built from a predetermined water release schedule which itself is determined in consideration of all project purpose excluding power such as fish habitat, water supply, and flood control. The Nimbus Dam then releases water according to that schedule with normal releases made primarily through the powerplant. As a peaking facility, Folsom Powerplant then generates within the capabilities of the regulating reservoir downstream combined with scheduled water releases. Designated Folsom units are also maintained as NERC blackstart resources under the Western Area Power Authority's Sierra Nevada Region System Restoration procedure OP-010.





# Table 1. Facility Description

Item	Information Requested	Response (include references to further details)
Name of the Facility	Facility name (use FERC project name or other legal name)	Folsom Dam National ID # CA10148 Nimbus Dam National ID # CA10174
Location	River name (USGS proper name)	American River
	Watershed name (select region, click on the area of interest until the 8-digit HUC number appears. Then identify watershed name and HUC-8 number from the map at: <u>https://water.usgs.gov/</u> wsc/map_index html)	Folsom and Nimbus 18020111 https://water.usgs.gov/lookup/getwatershed?18020111/ www/cgi-bin/lookup/getwatershed
	Nearest town(s), county(ies), and state(s) to dam	<b>Folsom</b> City of Folsom, County of Sacramento, CA <b>Nimbus</b> City of Folsom, County of Sacramento, CA
	River mile of dam	<b>Folsom</b> – located at the confluence of the North and South Forks of the American River, or at approximate river mile 30 on the American River above its confluence with the Sacramento River. <b>Nimbus</b> Nimbus Dam is located at approximate river mile 23 on the American River above its confluence with the Sacramento River.
	Geographic latitude of dam	Folsom -121.1528 Nimbus -121.2233
	Geographic longitude of dam	Folsom           38.7083           Nimbus           38.6367
Facility Owner	Application contact names (Complete the Contact Form in Section B-4 also):	Drew Lessard, Area Manager (CCAO) Steven Melavic, Chief of Power Operations, Central Valley Operations

Item	Information	<b>Response</b> (include references to further details)
	Requested	1 ( 5 5 /
	Facility owner	U.S. Bureau of Reclamation
	company and	Central California Area Office (CCAO)
	authorized owner	Area Office Manager
	representative name.	7794 Folsom Dam Road
	For recertifications:	Folsom, CA 95630
	If ownership has	
	changed since last	
	certification provide	
	the date of the	
	change	
	EEDC licensee	Not applicable
	acompany name (if	Not applicable.
	different from owner)	
Dagulatom	EEDC Draigat Number	Not applicable. Not subject to EEBC invisition
Kegulalory	(a a D www.)	Not applicable. Not subject to FERC jurisdiction
Status	(e.g., P-XXXX),	
	issuance and	
	expiration dates, or	
	date of exemption	NT / 1' 11
	FERC license type	Not applicable.
	(major, minor,	
	exemption) or special	
	classification (e.g.,	
	"qualified conduit",	
	"non-jurisdictional")	
	Water Quality	Issuing Agency: US Army Corps of Engineers
	Certificate identifier,	
	issuance date, and	Water Quality Certificate Identifier: none – project was
	issuing agency name.	constructed prior to the Clean Water Act. USACE
	Include information on	Water Control Manual Update
	amendments.	https://www.spk.usace.army.mil/Portals/12/documents/
		civil_works/JFP/Water%20Control%20Manual%20Up
		date/DSEAandAppendices2017/IndividualDocs/WCM
		UpdateDraftSEAEIR_06022017.pdf?ver=2017-06-07-
		<u>115751-173</u>
		2013 WQC for spillway project.
		https://www.waterboards.ca.gov/centralvalley/board_d
		ecisions/adopted_orders/401_wqcerts/5A34CR00573.p
		<u>df</u>
		2013 Amendment 1
		https://www.waterboards.ca.gov/centralvalley/board_d
		ecisions/adopted_orders/401_wqcerts/5A34CR00573A
		<u>1_amend.pdf</u>
		2016 Amendment 2

Item	Information Requested	Response (include references to further details)
	Keyüesteü	https://www.waterboards.ca.gov/centralvallev/board_d
		ecisions/adopted_orders/401_wacerts/5A34CR00573A
		2 amend.pdf
	Hyperlinks to key	Not applicable
	electronic records on	11
	FERC e-library	
	website or other	
	publicly accessible	
	data repositories	
Powerhouse	Date of initial	Folsom
	operation (past or	1956. Construction of the Folsom Powerplant began in
	future for pre-	June 1951 and was completed in 1955.
	operational	Nimbus
	applications)	Construction occurred from 1952 to 1955. Nimbus
		Dam and Powerplant began operating in 1955.
	Total installed	Folsom
	capacity (MW)	198.72 MW
	For recertifications:	3 Francis turbines, above-ground, rated head is 300 feet
	Indicate if installed	Nimbus
	capacity has changed	15.53 MW
	since last	2 generating units at 7.763 MW each
	certification	
	Average annual	Folsom
	generation (MWh) and	691,358 MWh
	period of record used	
	For recertifications:	Nimbus
	Indicate if average	67,752 MWh
	annual generation	
	has changed since	
	last certification	
	Mode of operation	Folsom and Nimbus
	(run-oi-river, peaking,	Folsom Powerplant is operated as a peaking plant in
	storage diversion	Nimbus Dem and Dowerplant such that hydronowor
	storage, diversion,	numbus Dani and Powerplant such that hydropower
	For recertifications.	Powerplant units are also maintained as NERC
	Indicate if mode of	hlackstart resources under the Western Area Dower
	oneration has	Authority's Sierra Nevada Region System Restoration
	changed since last	procedure OP-010
	certification	
	Number, type, and	Folsom
	size of turbines.	Water from the dam is released through three penstocks
	including maximum	located to the right of the spillway. They are 560 feet in
	and minimum	length and 15.5 feet in diameter, to three generating

Item	Information	Response (include references to further details)
	Requested	
	hydraulic capacity of	units, each rated at just over 76,000 kilowatts (74,000
	each unit	HP) and with a combined rating of 198,720 kilowatts.
		https://www.usbr.gov/mp/mpr-
		news/docs/factsheets/folsom-dam-reservoir-
		powerplant.pdf
		Each penstock has 2300 cfs capacity flow to turbine.
		https://watershed.ucdavis.edu/shed/lund/dams/Folsom/ FolsomDam.html#Construction%20Type
		Nimbus
		Nimbus Powerplant is located on the right abutment of
		have a capacity of 7 763 kilowatts each. Water is
		supplied to the two 9 400 horsenower turbines that
		drive the generators through six 46.5 foot-long
		penstocks.
	Trashrack clear	The penstocks on Folsom Dam each have a trashrack
	spacing (inches), for	structure that extends from El 284.10' to El 428.00'
	each trashrack	(NGVD 29). The structure is a semicircular shape with
		5 vertical bays and a flat roof at El 428.00'. The bay
		openings for the trashracks are approximately 7'-7" per
		the original drawings. The roof has a horizontal
		opening that is approximately 20' x 6" for the stoplogs.
		The Trashrack panels are constructed with 2"x5/8" flat
		bar on approximately 2.5" spacing for the trashracks.
		temperature control device added to it. This allows
		water to be pulled from four different zones in the
		reservoir depending on season and lake elevation
	Dates and types of	Folsom
	major equipment	During 2011-2015, all three of the Folsom Powerplant
	upgrades	hydroelectric units were upgraded with new turbine
	10	runners and generator rewinds. On average, the plant
		increased its generation for the same amount of water
		by 2-3%.
		Nimbus
		In 2006 the Nimbus Radial Gate Refurbishment project
		was initiated. The project was broken into three phases
		with the final phase being complete officially in 2019.
		The project consisted of completely recoating the
		upstream and downstream of the gates. While gates

Item	Information	Response (include references to further details)
	Requested           Dates, purpose, and           type of any recent	were blasted to bare steel, they were weld repaired for any pitting. The seals and corroded hardware were replaced along with the wire ropes, A cathodic protection system was installed as well. During the project spalling of concrete in the spillway and on the upstream apron was repaired and excessive sediment was dredged. <b>Folsom</b> The Flood Control Manual was revised to incorporate
	operational changes	<ul> <li>new forecasting technologies.</li> <li>Per Section 101(e) of the Water Resources</li> <li>Development Act (WRDA) of 1999, USACE was</li> <li>directed by Congress to update the water control</li> <li>manual (WCM) for Folsom Dam to fully realize the</li> <li>flood risk management and dam safety benefits of the</li> <li>JFP. The new set of reservoir operation rules has been</li> <li>developed to meet, at a minimum, the following five</li> <li>primary dam safety and flood risk management</li> <li>objectives:</li> <li>Pass the PMF while maintaining at least 3 feet of</li> <li>freeboard below the top of dam to stay within the</li> <li>dam safety constraints of Reclamation.</li> <li>Control a 1/100 annual chance event ("100-year</li> <li>flood") to the normal objective release of 115,000</li> <li>cfs as criteria set by SAFCA to support FEMA</li> <li>levee accreditation along the American River.</li> <li>Control a 1/200 annual chance event ("200-year</li> <li>flood") as defined by criteria set by DWR to a</li> <li>maximum release of 160,000 cfs.</li> <li>Reduce the variable space allocation from the</li> <li>current operating range of 400,000-670,000 AF to</li> <li>400,000-600,000 AF as directed in WRDA 99</li> <li>authorizing language.</li> <li>Incorporate improved forecasting capabilities from</li> <li>the National Weather Service (NWS).</li> </ul> Nimbus Folsom Lake, the deep storage reservoir located just <ul> <li>upstream of Lake Natoma, has strong thermal</li> <li>stratification, and is used to provide cool water for the</li> <li>lower American River. Lake Natoma, a small re-</li> <li>regulation reservoir with run-of-the-river flows, has</li> <li>weak thermal stratification with significant natural</li> </ul>

Item	Information	Response (include references to further details)
	Requested	
		heating during summer flow operating conditions. Cold
		water released from Folsom Dam warms as it passes
		through Lake Natoma during the warmer seasons.
		Aquatic biological resources, primarily anadromous
		salmonid fish (fall-run Chinook salmon and steelhead),
		can be adversely affected by warm temperatures in the
		lower American River downstream from Nimbus Dam
		in Sacramento County, California. Several structural
		and operational modifications at Lake Natoma and
		Folsom Dam were identified to potentially improve the
		efficiency of transporting cold water though Lake
		Natoma for release through Nimous Dam into the
		lower American River.
		2017 Modified Lower American River Flow
		Management Standards:
		Beginning in 2000, the Water Forum worked jointly
		with state and federal agencies for 5 years to develop a
		rigorous, science-based flow management standard.
		The key to this work was an improved understanding
		of the definition of healthy conditions for fish. Many
		experts said that water temperature is equally, if not
		for lower American River fish. This work resulted in a
		2006 proposed standard that specified minimum
		releases from Folsom and Nimbus Dams and a new
		approach to managing water temperatures.
		The 2006 FMS is a set of measures that includes
		minimum release requirements and water temperature
		objectives, oversight by an interagency workgroup
		called the American River Group, and monitoring and
		evaluation. Unlike other flow standards, the 2006
		FMS uses a sliding scale for minimum flow releases,
		and water temperature targets that balance available
		water supplies with achievable objectives to preserve
		wildlife and biological functions within the river.
		The 2009 Biological Opinion and recent drought
		impacts led to the development of a better approach:
		une monified r low management Standard that builds
		Our analytical pursuit was guided by three objectives:
		1 Improve conditions for fish in the lower
		American River
		American Kiver;

Item	Information	Response (include references to further details)
	Requested	
	Requested	<ol> <li>Reduce the risk of dead pool conditions in Folsom Reservoir; and</li> <li>Avoid redirected impacts to Sacramento River salmonids.</li> <li>We determined that carryover storage protection in Folsom Reservoir will provide both improved temperature conditions for lower American River salmonids and help avoid Folsom dead pool conditions. However, we also learned that storage protections at Folsom Reservoir could create temperature problems for the Sacramento River. After conducting and review hundreds of modeling runs, our team found a "sweet spot" condition that meets all three of our objectives.</li> <li>In other words, we could generate greater benefits for the American River basin (for both fish and water supplies) but at the expense of creating redirected impacts to Sacramento River fisheries.</li> <li>The resulting approach is embodied in the Modified FMS, which includes updated minimum flow curves, minimum storage recommendations for end-of- December and end-of-May, and annual temperature planning recommendations.</li> </ol>
	Plans, authorization, and regulatory activities for any facility upgrades or license or exemption amendments	None planned at this time.
Dam or	Date of original	Folsom
Diversion	construction and description and dates of subsequent dam or diversion structure modifications	Powerhouse and current dam construction began in 1948 and was completed in 1956. 2017 Folsom Dam Safety / Flood Damage Reduction Project (Joint Federal Project (JFP) -
		A new spillway was constructed to increase the Sacramento's level of flood protection. Originally called the Joint Federal Project (JFP) and renamed the Folsom Auxiliary Spillway, the new spillway features six top-seal radial gates. The purpose of the JFP is to (1) reduce flood risk in the Sacramento Metropolitan Area in conjunction with other features of the regional flood risk management system, and (2) pass the Probable Maximum Flood (PMF) while maintaining at

Item	Information	Response (include references to further details)
	Requested	
		least 3 feet of freeboard to the top of dam for dam safety purposes. The JFP is designed to improve the ability of Folsom Dam to manage large flood events by allowing more water to be safely released earlier in a storm event, resulting in more storage capacity remaining in the reservoir to hold back the peak inflow. This is accomplished through construction and operation of a new gated auxiliary spillway, with a spillway crest elevation 50 feet lower in elevation than the current gated spillways at Folsom Dam. The purpose of the Manual Update is to establish new operational changes to fully realize the flood risk management and dam safety benefits of the new auxiliary spillway in coordination.
		Folsom Dam Raise – The US Army Corp of Engineers in coordination with Dam Safety is working on raising the dam 3.5-feet. It is a phased project that will consist of multiple contracts that raise the Dikes; MIAD; and the Main, Right and Left Wing Dam. The main Dam raise will utilize the upstream parapet wall and the addition of a top seal to the radial gates to accomplish the required raise. Some of the work has begun and the design for the Main Dam is at 95% with a goal of going to construction in early 2022.
		Nimbus 2019 Nimbus Hatchery Fish Passage Project, which involves reorienting the hatchery's fish ladder into the Nimbus Basin and removing the existing fish weir. This project will create and maintain a reliable system of collecting adult salmon and steelhead broodstock for the hatchery and increase the amount of natural spawning and rearing habitat available in the lower American River. The changes will also minimize American River flow fluctuations associated with installation and removal of the hatchery's weir and eliminate health and safety concerns relative to the deterioration of the existing weir structure. The new spawning habitat opened up by the permanent removal of the weir will improve juvenile salmon production and increase harvest opportunities downstream.
	Dam or diversion structure height	Folsom

Item	Information Requested	Response (include references to further details)
	including separately, the height of any flashboards, inflatable dams, etc.	340 feet; elevation is 480.5 ft MSL; crest is 1,400 feet long and 36 feet wide; freeboard 5.1 ft; base width is 270 feet. Total embankment is 1,170,000 cu. yd.
		Nimbus Nimbus Dam is a concrete gravity dam with a structural height of 87 feet. Crest elevation is 132 feet, crest length is 1,093 feet and crest width is 28 feet.
	Spillway elevation and hydraulic capacity	Folsom Original spillway is 481 MSL, gated overflow type. There are 5 main spillway gates and 3 emergency (auxiliary) spillway gates. The maximum outlet capacity is 115,000 cfs. https://watershed.ucdavis.edu/shed/lund/dams/Folsom/ FolsomDam.html#Construction%20Type
		<u>Nimbus</u> Spillway capacity is 300,000 cfs at an elevation of 126.5 feet. The drainage area is 1,898 square miles.
	Tailwater elevation (provide normal range if available)	<b>Folsom and Nimbus</b> When the power plant is not in operation, tailwater elevation is consistent with surface elevation of Lake Natoma. Lake Natoma normal elevation range is from 120.0-125.5 feet.
	Length and type of all penstocks and water conveyance structures between the impoundment and powerhouse	Folsom 3 penstocks, 560 feet long and 15.5 feet in diameter, to 3 generating units. Nimbus It has 18 radial gates, each 40-feet by 24-feet, to control the flows.
	Dates and types of major infrastructure changes	See above
	Designated facility purposes (e.g., power, navigation, flood control, water supply, etc.)	Flood control, water supply, recreation, power, water quality, salinity control, environmental restoration.
	Source water	Middle/North Fork American River, South Fork American River, American River tributaries, Folsom Reservoir,

Item	Information Requested	Response (include references to further details)
	Receiving water and	Falsom
	location of discharge	Middle/North Fork American River, South Fork
	location of discharge	American River, American River tributaries.
		Nimbus
		American River
Conduit	Date of conduit	Not applicable
	construction and	
	primary purpose of	
	conduit	
Impoundme	Authorized maximum	Folsom
nt and	and minimum water	Storage capacities:
Watershed	surface elevations	Min pool 90,000 acre-feet
	For recertifications:	Max capacity 1,010,294 acre-feet
	Indicate if these	Flood control 610,000 acre-feet
	values have changed	
	since last	Nimbus – not applicable
	<b>Certification</b>	Falaces
	Normal operating	Folsom
	fluctuation range	(NGVD20) New Forecast Paged Operations program
	For recordifications:	(NOVD29) - New Forecast Based Operations program
	For recertifications.	425.65 300.06 between Nov 10 <sup>th</sup> and Eeb 28 <sup>th</sup> (20 <sup>th</sup> )
	values have changed	425.05 - 599.00 between Nov 19 and Feb 28 (29).
	since last	Nimbus – not applicable
	certification	
	Gross storage volume	Folsom
	and surface area at full	Folsom Lake is 11,450 acres (17.9 square miles) /
	pool	reservoir has 1,010,294 acre-feet of gross storage
	For recertifications:	Nimbus
	Indicate if these	Nimbus Dam forms Lake Natoma, with a surface area
	values have changed	of 540 acres and a capacity of 8,760 acre-feet at an
	since last	elevation of 125 feet.
	certification	
	Usable storage volume	Storage capacities for flood control and water supply
	and surface area	• minimum pool 90,000 acre-feet
	For recertifications:	• flood control 610,000 acre-feet
	Indicate if these	
	values have changed	
	since last	
	certification	Not conficility the body and set to sent 1.4
	Describe requirements	not applicable – the hydro project does not control the
	impoundment inflored	impoundment operations.
	autflow, up/down	
	outtiow, up/down	

Item	Information Requested	Response (include references to further details)
	ramping and refill rate restrictions.	
	Upstream dams by name, ownership and river mile. If FERC	North Fork American River Lake Clementine (North Fork), USACE. Lake Valley, PG&E.
	licensed or exempt, please provide FERC Project number of these dams. Indicate which upstream dams have downstream fish	Middle Fork American River French Meadows, SMUD, FERC No. 2079 Ralston, SMUD, FERC No. 2079 Many natural and artificial barriers to fish passage in the river
	passage.	South Fork American River Upper American River, SMUD, FERC No. 2101 Chili Bar, PG&E, FERC No. 2155 El Dorado, El Dorado Irrigation District, FERC No. 184 Rock Creek, Rock Creek Hydro LLC, FERC No. 3189
		Additional dams on smaller tributaries are listed in Appendix 1
	Downstream dams by name, ownership, river mile and FERC number if FERC licensed or exempt. Indicate which downstream dams have upstream fish passage	Nimbus Dam is located 7 miles downstream of Folsom Dam on the American River. Both dams are operated by USBR. There are no dams downstream of Nimbus Dam and the river is unrestricted to the Bay Delta, allowing upstream fish passage from the ocean. The Folsom South Canal is an aqueduct that diverts water from the American River at Nimbus Dam and travels about 26.7 miles in a southerly direction, terminating near Clay, about 10 miles northeast of Lodi. The canal is operated by the U.S. Bureau of Baslamation as nort of the Awhurn Falsage South Unit
	On anting a supervised	of the CVP.
	Operating agreements with upstream or downstream facilities that affect water availability and facility operation	A portion of the supply in Folsom Lake must be set aside for environmental use, the second largest percentage of Folsom's water demand. (CA Water Plan, 130). The CVP Improvement Act (CVPIA) of 1992 reallocated 800,000 acre-feet of supplies from its reservoirs for fish and wildlife (CA Water Plan, 2), thus increasing the amount of water from Folsom to be

Item	Information Requested	Response (inclu	ude referen	ices to further	details)			
	Keyuesteu	unal for ouring						
		issues include (	nmentai pu Folsom Da	rposes. Enviro m & Reservoir	r, V-18)			
		<ul> <li>Protection</li> <li>fisheries</li> <li>Protection</li> <li>bald eage</li> <li>valley e</li> <li>Water q</li> </ul>	on of veget s, along the on of the er gles, winter lderberry lo uality	ation and wild American Riv ndangered spec chinook salmo onghorn beetle	life, as well as 'er cies such as the on, and the s			
		Fish are sensitive which is too was temperature of monitored with at 65 degrees F	ve to the wa urm, will ki the water re a goal of n from May	ater temperatur Il their eggs. T eleased from F naintaining the v15 to October	e. Water The olsom is temperature 31			
		NimbusDue to the contamination of the groundwater because of environmental degradation in the lower American River, the County of Sacramento created a Water Forum in 1993. Working together with water managers from Eldorado and Placer Counties, the Forum plans to provide a clean and reliable supply of water to the region by 2030 and to protect the wildlife and fish in the Lower American River. Signed in April 2000, the Water Forum Agreement called for the implementation of increased surface water diversions, habitat management, water conservation, and an improved standard of flow.http://www.waterforum.org/wp- content/uploads/2014/08/Water-Forum-Agreement- ult a to 2015 DDAL FOR DDD/TTO - 16						
	Area of land (acres) and area of water (acres) inside FERC project boundary or under facility control.	<ul> <li>Folsom Lake is 11,450 acres of water, lands associ with the powerhouse and spillway are approximate 215 acres.</li> <li>Nimbus is 540 acres of water, lands around the dar powerhouse and fish hatchery facilities are approximately 53 acres.</li> </ul>						
Hydrologic Setting	Average annual flow at the dam, and period of record used		Water Year	Flow below Nimbus (CFS)				
			2010	2,618				

Item	Information Requested	Response (include references to further details)						
			2011	6,430				
			2012	2,575				
			2013	2,289				
			2014	1,223				
			2015	1,321				
			2016	3,072				
			2017	9,483				
			2018	3,513				
			2019	5,233				
	Average monthly flows and period of record used	A typical daily flow in the summer is 3,000 cfs Determining how much water to release from I and the other CVP reservoirs is constantly beir assessed in coordination with numerous agenci including the California Department of Water Resources, State Water Resources Control Boa California Department of Fish and Wildlife, Na Marine Fisheries Service, U.S. Fish and Wildlif Service, and the Corps. Reclamation also coord CVP operations with 271 CVP contractors, 80 Preference Power customers, numerous enviro groups, federally recognized tribes, and Native American groups in an effort to jointly maximi operational flexibility of both the CVP and Cal State Water Project. https://www.usbr.gov/mp/docs/folsom-dam-an reservoir-faq-draft.pdf Nimbus Daily flows range from 1,500 cfs to 80,000 cfs https://www.dreamflows.com/graphs/yir.076.p						
	closest stream gauging	See <u>Appendix 2</u>	<u>-</u>					
	stations above and below the facility							
	Watershed area at the dam (in square miles). Identify if this value is prorated and provide the basis for proration.	<b>Folsom and Nimbus</b> Impounds runoff from 1,875 sq miles of mountainous terrain						

Item	Information	Response (include references to further details)
	Requested	
Designated	Number of zones of	Four (4)
Zones of	effect	
Effect	Upstream and	ZOE 1 – Folsom impoundment from dam at RM 30
	downstream locations	upstream 8.6 river miles to North Fork inflow location
	by river miles	ZOE 2 - Folsom downstream reach to the upper extent
		of Nimbus impoundment, 2.6 river miles to Folsom
		Blvd Bridge and tributary inflow
		ZOE 3 - Nimbus impoundment, 4.21 river miles from
		Folsom Blvd Bridge to dam at RM 23
		ZOE 4 - Nimbus downstream reach, 2 river miles to
		island and second tributary inflow
	Type of waterbody	ZOE 1 –impoundment
	(river, impoundment,	ZOE 2 – downstream reach
	bypassed reach, etc.)	ZOE 3 - impoundment
		ZOE 4 - downstream reach
	Delimiting structures	See above
	or features	
	Designated uses by	Designated uses include municipal and irrigation water
	state water quality	supply, industrial and power supply, recreation, aquatic
	agency	habitat, and wildlife habitat.

## 2.0 ZONES OF EFFECT

The Project includes four zones of effect as shown in Figures 2-5. Standards selections for each zone are shown in Table 2 and discussed in Section 3.0 below.

		CRITERION								
Zone No.,		A B C D		Ε	F	G	Н			
Zone Name, and Standard Selected (including PLUS if selected)	d Standard lected ncluding LUS if lected) LUS if		Shoreline and Watershed Protection	Threatened and Endangered Species	Cultural and Historic Resources	Recreational Resources				
Zone 1 – Folsom Impoundment	RM 38.6 – RM 30	2	2	4	4	3	3	2	3	
Zone 2 – Folsom Downstream Reach	RM 30 - RM 27.21	2	2	4	4	3	3	2	3	
Zone 3 – Nimbus Impoundment	RM 27.21 – RM 23	2	2	4	4	3	3	2	3	
Zone 4 – Nimbus Downstream Reach	RM 23 - RM 21	2	2	4	4	3	3	2	3	

Figure 2. Zones of Effect Overview



Figure 3. Zone 1 – Folsom Impoundment





Figure 4. Zones 2 and 3 – Folsom Downstream Reach and Nimbus Impoundment

Figure 5. Zone 4 – Nimbus Downstream Reach



#### **3.0 SUPPORTING INFORMATION**

#### A. Ecological Flow Regimes

Criterion	Standard	Instructions
А	2	Agency Recommendation:
A	2	<ul> <li>Agency Recommendation:</li> <li>Identify the proceeding and source, date, and specifics of the agency recommendation applied (NOTE: there may be more than one; identify and explain which is most environmentally protective).</li> <li>Explain the scientific or technical basis for the agency recommendation, including methods and data used. This is required regardless of whether the recommendation is or is not part of a Settlement Agreement.</li> <li>Explain how the recommendation relates to formal agency management goals and objectives for fish and wildlife.</li> <li>Explain how the recommendation provides fish and wildlife protection, mitigation and enhancement (including in-stream flows, ramping and peaking rate conditions, and seasonal and</li> </ul>
		Explain how flows are monitored for compliance.

All Zones qualify for Standard A-2.

Per Section 101(e) of the Water Resources Development Act (WRDA) of 1999, the US Army Corps of Engineers (USACE) was directed by Congress to update the <u>water control manual</u> (WCM) for Folsom Dam to fully realize the flood risk management and dam safety benefits of the JFP. The new set of reservoir operation rules has been developed to meet, at a minimum, the following five primary dam safety and flood risk management objectives:

- Pass the Probable Maximum Flood (PMF) while maintaining at least 3 feet of freeboard below the top of dam to stay within the dam safety constraints of Reclamation.
- Control 100-year flood events to the normal objective release of 115,000 cfs to support FEMA levee accreditation along the American River.
- Control 200-year flood events as defined by criteria set by California Department of Water Resources (DWR) to a maximum release of 160,000 cfs.
- Reduce the variable space allocation from the current operating range of 400,000-670,000 acre-feet to 400,000-600,000 acre-feet as directed in WRDA 99.
- Incorporate improved forecasting capabilities from the National Weather Service (NWS).

Folsom Lake, the deep storage reservoir located just upstream of Lake Natoma, has strong thermal stratification, and is used to provide cool water for the lower American River. Lake Natoma created by Nimbus Dam, a small re- regulation reservoir with run-of-the-river flows, has weak thermal stratification with significant natural heating during summer flow operating

conditions. Cold water released from Folsom Dam warms as it passes through Lake Natoma during the warmer seasons. Aquatic biological resources, primarily anadromous salmonid fish (fall-run Chinook salmon and steelhead), can be adversely affected by warm temperatures in the lower American River downstream from Nimbus Dam in Sacramento County, California. Several structural and operational modifications at Lake Natoma and Folsom Dam were identified to potentially improve the efficiency of transporting cold water though Lake Natoma for release through Nimbus Dam into the lower American River.

Beginning in 2000, the <u>Water Forum</u> worked jointly with state and federal agencies for 5 years to develop a rigorous, science-based flow management standard (FMS) to preserve the fishery, wildlife, recreational and aesthetic values of the lower American River. The key to this work was an improved understanding of the definition of healthy conditions for fish. Many experts said that water temperature is equally, if not more important, than flows for improving conditions for lower American River fish. This work resulted in a 2006 proposed standard that specified minimum releases from Folsom and Nimbus Dams and a new approach to managing water temperatures.

The 2006 FMS is a set of measures that includes minimum release requirements and water temperature objectives, with oversight by an interagency workgroup called the American River Group, and with monitoring and evaluation. Unlike other flow standards, the 2006 FMS uses a sliding scale for minimum flow releases, and water temperature targets that balance available water supplies with achievable objectives to preserve wildlife and biological functions within the river. The foundation of the 2006 FMS is its adaptive Minimum Release Requirement (MRR) and water temperature objectives. The MMR uses a sliding scale for minimum flows and establishes water temperature targets that balance available water supplies with achievable biological objectives. The flow progression has been developed to provide more water when anadromous salmonids are expected to be spawning and rearing in the lower river.

The <u>2009 Biological Opinion</u> from NOAA and recent drought impacts led to the development of a better approach: the 2015 <u>Modified Flow Management Standard</u> that builds upon and improves the 2006 FMS with three objectives:

- 1. Improve conditions for fish in the lower American River;
- 2. Reduce the risk of dead pool conditions in Folsom Reservoir; and
- 3. Avoid redirected impacts to Sacramento River salmonids.

The goals of the Modified FMS are to protect anadromous salmonids in the lower American River and avoid catastrophic water shortages in the basin without redirecting negative environmental impacts to other areas. The resulting approach is embodied in the Modified FMS, which includes updated minimum flow curves, minimum storage recommendations for end-of-December and end-of-May, and annual temperature planning recommendations.

Releases from Folsom and Nimbus dams are operated under State water rights permit and fish protection requirements. The State Water Resources Board Decision D-893 in 1958 required minimum flows of 250 cfs from January through mid-September and 500 cfs between mid-September through December 31. The Water Forum, in cooperation with Reclamation, National Marine Fisheries Service (NMFS), US Fish and Wildlife Service (FWS), and the California

Department of Fish and Wildlife (CDFW), subsequently developed the Flow Management Standard (FMS) for the Lower America River as a better alternative to the 1958 requirements. The Modified FMS regulates flows in the river below Nimbus Dam, establishing Minimum Release Requirements (MRR) from 800 to 2,000 cfs. It was determined<sup>1</sup> that flows in the lower river of 800 cfs provide 80% of the available spawning habitat. The maximum amount of habitat is provided at 2,000 cfs, and the amount of spawning habitat decreases at flows higher than 2,000 cfs. The Water Forum estimated that flows of 500 cfs (the prior higher minimum flow) provide about 40% of the maximum amount of spawning habitat. Accordingly, increasing flows from 500 to 800 cfs doubles the amount of spawning habitat, and flows below 500 cfs create adverse conditions for spawning and rearing.

The specified MRR is higher in wet years and lower in dry years. These adjustments are made in response to specific conditions related to the need for spawning flow progressions, fish protection, and reservoir water conservation. The resultant MRR varies throughout the season as shown in Table 2 and Figures 6 and 7.

Time Period	MRR Range (cfs)	Index	Relevance of Index				
October	800 to 1,500	Four Reservoir Index (FRI)	Indicates the amount of upstream				
November and December	800 to 2,000	FRI	and winter months				
January and February	800 to 1,750	Sacramento River Index (SRI)	Indicates current multi-basin water availability				
March through Labor Day	800 to 1,750	Folsom Inflow Index (IFII)	Forecasts water availability for the				
Post-Labor Day through September 800 to 1,500		IFII	remainder of the current water year				

Table 2. MRR Seasonal Flows

<sup>&</sup>lt;sup>1</sup> <u>https://www.fws.gov/lodi/instream-flow/instream-flow.htm</u> and <u>https://www.fws.gov/lodi/anadromous\_fish\_restoration/documents/AR\_PHABSIM\_2D\_Modeling\_2003Report.pdf</u>



#### Figure 6. Method for computing seasonal release allocation

Figure 7. Seasonal Minimum Release Requirements



- The FMS also includes exceptions to the MRR during extreme dry conditions, including: Conference Years: Occur when the projected March through November unimpaired inflow to Folsom Reservoir is less than 400,000 AF. A minimum flow of 190 cfs is required downstream of the H Street Bridge.
- Off-ramp Criteria: Triggered if Folsom Reservoir storage is forecasted to fall below 200,000 AF in the succeeding 12 months. In this case, downstream flow requirements rather than MRR become the minimum flow requirement throughout the lower American River.

To implement the Modified FMS, Reclamation computes the MMR each month as new hydrology data become available and would compute the Seasonal Release Allocation each month (in May through December) based on the latest hydrologic data and water storage level in Folsom Reservoir. There is an end-of-December storage target which puts a limit on the amount of water that can be released from storage between June and December and provides a reserve that improves water supply reliability and helps manage water temperatures in the river. In essence, the Minimum Release Requirements set the minimum amount of water to be released during each month, and the end-of-December storage target effectively sets the maximum amount of water that can be released over the entire season. Within these two "bookends," the seasonal and monthly allocations are computed each month starting in May (Figures 6 and 7).

Releases from Nimbus Dam pass through the Nimbus Power plant, or, at flows in excess of 5,000 cfs, the spillway gates.

#### B. Water Quality

Criterion	Standard	Instructions
В	2	Agency Recommendation:
		• Provide a copy of the most recent Water Quality Certificate and
		any subsequent amendments, including the date(s) of issuance. If
		more than 10 years old, provide documentation that the
		certification terms and conditions remain valid and in effect for the
		facility (e.g., a letter from the agency).
		• Identify any other agency recommendations related to water
		quality and explain their scientific or technical basis.
		• Describe all compliance activities related to water quality and any
		agency recommendations for the facility, including on-going
		monitoring, and how those are integrated into facility operations.

All Zones qualify for Standard B-2.

Surface water quality in Folsom Reservoir, Lake Natoma, and the Lower American River depends primarily on the mass balance of various water quality constituents from groundwater inputs, tributary inflow, permitted discharges from municipal and industrial sources, direct watershed runoff, urban runoff, and stormwater discharges. Water quality varies somewhat among years and seasonally within a year based primarily on these and related factors.

The projects were not issued water quality certificates (WQC) at the time of construction since they pre-date the Clean Water Act. However, Folsom received a WQC on January 18, 2013 for construction of a new spillway. The original Certification was rescinded and reissued on April 10, 2013 and amended on September 20, 2013 again on June 3, 2016.<sup>2</sup>

The American River is listed in the current (2014-2016) state impaired waters list<sup>3</sup> as Category 5 waters in need of a TMDL. Impairments are listed for mercury, toxicity, PCBs, pesticides and bacteria from Nimbus Dam downstream to the Sacramento River, and only for mercury in Folsom Lake and the reach between Folsom Dam and Nimbus. The sources are listed as unknown, but likely related to effects from historical mining.

However, the river reaches in the project vicinity have historically met their beneficial uses<sup>4</sup> and are listed as achieving applicable beneficial uses as of 2018 based on the <u>Water Quality Control</u> <u>Plan</u> for the Sacramento River Basin as shown in Table 3.

<sup>&</sup>lt;sup>2</sup> <u>https://www.waterboards.ca.gov/centralvalley/board\_decisions/adopted\_orders/401\_wqcerts/5A34CR00573.pdf</u>, <u>https://www.waterboards.ca.gov/centralvalley/board\_decisions/adopted\_orders/401\_wqcerts/5A34CR00573A1\_ame\_nd.pdf</u>, and

https://www.waterboards.ca.gov/centralvalley/board\_decisions/adopted\_orders/401\_wqcerts/5A34CR00573A2\_ame\_nd.pdf

https://www.waterboards.ca.gov/centralvalley/water\_issues/tmdl/impaired\_waters\_list/2014\_int\_rpt\_dev/2014\_2016\_int\_rpt/2014\_2016\_303d\_list\_w\_sources.xls

<sup>&</sup>lt;sup>4</sup> <u>https://www.waterforum.org/wp-content/uploads/2015/09/WF\_DEIR-Document-1\_res.pdf</u>

Table 3. American River Beneficial Uses	Table 3.	American	River	<b>Beneficial</b>	Uses
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	TABLE 2-1 (cont'd)																		
			- ***		500			DEIN			J3E3								
				AGR -TI	ICUL JRE	IN	DUST	RY	RE	CREA	TION	FRE WAT HABIT	SH- TER AT (2)	MIG	GRA- ON	SP/ NII	۹۳- NG		
	SURFACE WATER BODIES		MUN		GR	PR OC	IND	PO W	RE	EC-1	REC- 2	WARM	COLD	М	GR	SP	WN	WILD	NAV
		HYDRO UNIT NUMBER	MUNICIPAL AND DOMESTIC SUPPLY	IRRIGATION	STOCK WATERING	PROCESS	SERVICE SUPPLY	POWER	CONTACT	CANOEING AND RAFTING (1)	OTHER NONCONTACT	WARM	COLD	WARM (3)	COLD (4)	WARM (3)	COLD (4)	WILDLIFE HABITAT	NAVIGATION
43	BEAR RIVER	515.1	Е	Е	Е			Е	E	Е	Е	Е	Е	Р	Р	Р	Р	E	
	AMERICAN RIVER																		
44	NORTH FORK, SOURCE TO FOLSOM LAKE	514.5	E	E					E	E	E	Р	E				E	E	
45	MIDDLE FORK, SOURCE TO FOLSOM LAKE	514.4	E	E	E			Е	E	E	E	Р	E				E	E	
46	DESOLATION VALLEY LAKES	514.4							E		E		Е				Е	E	
	SOUTH FORK																		
48	SOURCE TO PLACERVILLE	514.3	E					Е	E	E	Е	Р	Е				Е	E	
49	PLACERVILLE TO FOLSOM LAKE	514.32	E	E				Е	E	E	E	E	E					E	
50	FOLSOM LAKE	514.23	E	E			Р	Е	E		Е	E	Е			E		E	
51	FOLSOM DAM TO SACRAMENTO RIVER	519.21	E	E			E	Е	E	E	E	E	E	E	E	E	E	E	$\square$

LEGEND

E = EXISTING BENEFICIAL USES

P = POTENTIAL BENEFICIAL USES

L = EXISTING LIMITED BENEFICIAL USE

In 1991, the Sacramento Regional County Sanitation District, the County of Sacramento Department of Water Resources and the City of Sacramento jointly established the Sacramento Coordinated Water Quality Monitoring Program (CMP) to conduct water quality monitoring in the Sacramento and American rivers. The CMP has routinely monitored the river for heavy metals content and for compliance with conventional water-quality parameters. Monitoring has shown that water quality generally meets ambient water-quality criteria for aquatic life protection.

Reclamation prepares and implements an annual operations forecast and an annual water temperature plan, which contains forecasts of hydrology and storage; a modeling run or runs, using these forecasts, demonstrating that the temperature compliance can be attained; and, a plan of operations based on the modeling run(s) that demonstrates that water release patterns conform to the plan of operations. In developing the annual water temperature plan, Reclamation uses an iterative approach, varying proposed operations, including alternate release patterns, to attain the water temperature objectives shown below.

Since February 2020 Reclamation has been operating to the 2019 Proposed Action (PA) on the Coordinated Long-Term Operation of the CVP and the State Water Project (SWP) SWP. In general, flows from Nimbus and Folsom Dam are managed, to the extent physically controllable,

to achieve the following objectives. The adaptive approach allows higher water temperatures during drier years when cold-water supplies are not available to support the optimal temperatures. Another potential cold water management alternative to improve temperature conditions for fish, are power bypasses

- For steelhead trout:
  - 65°F or less average daily water temperature at Watt Avenue Bridge (in Sacramento) between May 15 and October 31;
  - If 65°F cannot be achieved during the period between May 15 through October 31 at any point, the target daily average water temperature at Watt Avenue may be increased incrementally (1° steps) to as high as 68°F;
- For Chinook salmon (fall run): Average desired daily water temperature target is 60°F or less at Watt Avenue Bridge in October and 56°F at Hazel Avenue (bridge just downstream of Nimbus Dam) in November.

It is important to note that control of salt-water intrusion in the Sacramento-San Joaquin Delta is another purpose for Folsom Dam. Clean water from the reservoir is used, when required, to flush out salinity in the Delta, the source of drinking water for 22 million Californians.

#### C. Upstream Fish Passage

Criterion	Standard	Instructions
С	4	Acceptable Mitigation:
		• Describe the alternative mitigation measures being deployed in lieu of upstream fishways and provide documentation of agency approval of them.
		• Explain how the total benefits of the mitigation provided equals or exceeds the benefits that might accrue from providing upstream passage in terms of reproductive success (e.g., numbers of fish produced, or area of suitable habitat provided).
		• Explain how the alternative mitigation measures sustain the abundance and diversity of fish stocks in the river system.

There are no upstream fish passage facilities at Folsom or Nimbus.

All Zones qualify for Standard C-4 since all zones are subject to mitigation actions (although Zone 1 could in theory qualify for Standard C-1, not applicable/de minimis effect since once above the Folsom dam there is no further barrier to continued passage).

Since settlement of the Central Valley in the mid-1800s, populations of native anadromous fishes (chinook salmon, steelhead, white sturgeon, and green sturgeon) have declined dramatically. By 1900, habitat destruction in the higher streams of the American River had eliminated most of the originally more numerous spring run of chinook salmon and steelhead. By the 1940's this run was extinct.<sup>5</sup>

The original "Old Folsom Dam" was completed in 1893 (see Section 3.G below) and was located just downstream of the current Folsom Dam. In 1950, floods destroyed the fish ladder at the Old Folsom Dam, restricting fish to the lower 25 miles of the American River.<sup>6</sup>

The Nimbus hatchery was constructed in 1955 under a contract between the United States and the State of California at that time to mitigate for the salmon and steelhead runs and loss of spawning habitat that were blocked by construction of the Nimbus and Folsom dams. The hatchery is located about <sup>1</sup>/<sub>4</sub> mile downstream of Nimbus dam. In cooperation with CDFW and FWS, Reclamation designed and built the hatchery, and currently pays CDFW to operate and maintain the facility.

The Hatchery raises 4 million fall-run Chinook salmon and 430,000 steelhead trout annually. The fish ladder operates when fish are moving upstream from the ocean and conditions are appropriate for egg-taking. It usually opens around the first week of November for salmon and flows until the steelhead season ends typically in March. The hatchery raises and then releases the raised fish at three locations downstream of Nimbus dam when they are ready to migrate back to the ocean (see video <u>here</u>). Currently, the fish ladder is being replaced. Since 1955, much of the Hatchery infrastructure has been modernized, but the weir and ladder system are largely unchanged. The weir structure is aging and

<sup>&</sup>lt;sup>5</sup> <u>https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=95362&inline</u>

<sup>&</sup>lt;sup>6</sup> https://regionalparks.saccounty.net/Parks/Documents/Parks/ARPP06-021909\_sm.pdf

presents significant long-term maintenance, operational, safety and resource management issues. Annual river flow reductions are required in order to install and maintain the weir which results in public safety hazards as well as operational hazards. In years with significant winter water flows, extensive repairs have been necessary to repair weir damage, including scouring of the weir foundation. In years where extensive damage has occurred, flow reductions lasting approximately five to nine days have been necessary.

Reclamation is currently constructing the Nimbus Hatchery Fish Passage Project (Project) which will create and maintain a reliable system for collecting adult fish to assist with meeting mitigation obligations for spawning areas blocked by the construction of Folsom and Nimbus Dam and allow salmon and steelhead to utilize the spawning and rearing habitat between the existing Nimbus barrier weir and the base of Folsom Dam. In addition, the Project will improve public and employee safety, minimize annual operations and maintenance costs, eliminate the need to reduce river flows for annual weir installation and removal, and increase operational flexibility.

The Project consist of a concrete flume, a pool and weir fish ladder, and a rock-lined channel. The upper portion of the Project consist of a low-gradient concrete flume fishway that begins at the top of the fish ladder and extend along the south bank of the American River beneath the Hazel Avenue Bridge, to a point just downstream from the access road to Nimbus Shoals.

A pool and weir fish ladder section extend from the end of the flume section to a point along the edge of Nimbus Shoals. This is followed by a rock-lined trapezoidal channel that extend from the bottom of the ladder section to the edge of the Nimbus Dam stilling basin.

The Project require flows sufficient to attract fish and deep enough for operation. Design flow for the flume and fish ladder sections are up to 25 cfs, which will allow normal operation of the new Project. Supplemental water supplies up to an additional 40 cfs will provide an attract fish to the Project entrance. Supplemental flows are supplied at two locations: at the bottom end of the fish ladder and at the Project entrance.

The supplemental flows will help improve attraction to the Project and will maintain an adequate depth of flow in the rock channel section. An unused 42-inch pipeline from Lake Natoma to the Hatchery will provide up to 40 cfs for fish attraction flows. A new buried 30-inch pipeline from the existing 42-inch pipeline to the lower portion of the fish ladder will provide supplemental flows.

The new fish passageway will be opened when it is likely that water temperatures in the Hatchery could be maintained at approximately 60°F or lower, which usually occurs in the first two weeks of November.

The project will also create a public viewing area with viewing panels to replace the existing viewing area that will be decommissioned after acceptance of the new fish ladder. The Project is in construction and the current schedule show a completion date of June 15, 2021.

An adjacent hatchery raises rainbow trout and kokanee salmon which are stocked in over 250 lakes and streams including Folsom Lake in northern and central California for recreational fishing. That hatchery is funded through the sales of fishing licenses and managed by the California Department of Fish and Game.

Steelhead trout are listed as endangered under the federal and state endangered species acts. Other migratory species - American shad and striped bass - were introduced into the Sacramento-San Joaquin system in the 1870s. Both species supported valuable sport and commercial fisheries throughout much of this century, but California Department of Fish and Wildlife (CDFW) data indicate that populations have declined since the mid-1960s.

The Central Valley Project Improvement Act directed the Secretary of the Interior to develop and implement a program that makes all reasonable efforts to double natural production of anadromous fish in Central Valley streams by 2002 (Section 3406(b)(1)). A <u>Final Anadromous</u> <u>Fish Restoration Plan</u> was published in 2001. It gives first priority to measures which protect and restore natural channel and riparian habitat values through habitat restoration actions, modifications to CVP operations including at Folsom and Nimbus, and implementation of various supporting measures. The plan is reviewed and updated every five years and describes how the Secretary intends to operate the CVP to meet the fish, wildlife and habitat restoration goals and requirements.

Six general objectives need to be met to achieve the program goal:

- 1. Improve habitat for all life stages of anadromous fish through provision of flows of suitable quality, quantity, and timing, and improved physical habitat;
- 2. Improve survival rates by reducing or eliminating entrainment of juveniles at diversions;
- 3. Improve the opportunity for adult fish to reach their spawning habitats in a timely manner;
- 4. Collect fish population, health, and habitat data to facilitate evaluation of restoration actions;
- 5. Integrate habitat restoration efforts with harvest and hatchery management; and
- 6. Involve partners in the implementation and evaluation of restoration actions.

Restoration actions are selected and prioritized based on the magnitude of the contribution to doubling natural production, the status of target species and races, and on:

- Measures that protect and restore natural channel and riparian habitat values through habitat restoration actions;
- Modifications to Central Valley Project operations; and
- Implementation of the supporting measures

Target species include four races of chinook salmon, steelhead, striped bass, American shad, and white and green sturgeon.

NMFS issued a a <u>2019 Biological Opinion</u> related to listed fish species (see Section 3.F below) that included several actions to protect these species (winter-run chinook and steelhead). As related to Folsom and Nimbus, those actions include flow and water temperature management measures for steelhead and fall-run Chinook,. Other actions include development of a Nimbus fish hatchery genetic management plan and genetic studies to improve the genetic diversity of steelhead and the non-listed fall-run chinook.

#### D. Downstream Fish Passage and Protection
Criterion	Standard	Instructions
D	4	Acceptable Mitigation:
		<ul> <li>Describe the alternative mitigation measures being deployed in lieu of downstream fish passage and/or protection strategies and provide documentation of agency approval of the measures.</li> <li>Explain how the total benefits of the mitigation strategy equals or exceeds the benefits that might accrue from providing downstream passage in terms of reproductive success (e.g., numbers of fish produced, or area of suitable habitat provided).</li> </ul>
		• Explain how the alternative mitigation measures sustain the abundance and diversity of fish stocks in the river system.

There are no downstream fish passage facilities at Folsom or Nimbus.

All Zones qualify for Standard D-4 since all zones are subject to mitigation actions (although Zone 4 could in theory qualify for Standard D-1, not applicable/de minimis effect since once downstream of Nimbus dam there is no further barrier to continued passage).

In addition to the migratory species listed above, Folsom Lake provides habitat for species including largemouth, smallmouth, and spotted bass; rainbow trout, crappie, channel catfish, bluegill, Kokanee salmon, and brown and black bullhead.<sup>7</sup> Rainbow trout are stocked and sterile chinook salmon are stocked in the lake when they are available.<sup>8</sup> Trash racks at Folsom have 2.5-inch clear spacing which would allow some fish to become entrained; however, entrainment has not been evaluated. None of these species require passage to complete their lifecycles. Fish species that are or may be present downstream of Nimbus Dam include numerous native and non-native species (see Attachment 1, Table 1 on pp. 3-4).

Some of the mitigations described above for upstream passage also apply to downstream passage measures including flow and temperature management. Additional mitigations include restoring rearing habitat for juvenile steelhead below Nimbus dam by creating side channels, placement of woody material in the river, enhancing floodplain habitat, and placement of gravel to provide spawning areas.

The CVPIA directed the Department of the Interior to develop and implement a continuing program for the purpose of restoring and replenishing, as needed, salmonid spawning gravel lost due to the construction and operation of all of the CVP dams and other actions that have reduced the availability of spawning gravel and rearing habitat in the lower American River from Nimbus Dam to the confluence with the Sacramento River.

In a natural system, sediment continually enters a river and moves downstream. Thus, one of the principal needs for fall-run Chinook salmon and steelhead is replacement of spawning gravel of an appropriate size and creation of appropriate water depths and velocities at the flows that

http://www.californiasgreatestlakes.com/folsom\_fishing.html

<sup>&</sup>lt;sup>7</sup> <u>https://www.norcalfishreports.com/lakes/118/folsom-lake.php</u>, and

<sup>&</sup>lt;sup>8</sup> https://fishsniffer.com/index.php/2018/06/12/folsom-lakes-robust-rainbows-and-chinooks/

typically occur during the spawning season. This is currently accomplished by relocating gravel deposits from higher floodplain areas downstream of Folsom Dam and placing it strategically within the river.

Reclamation with assistance from the Water Forum has placed approximately 92,000 cubic yards of spawning gravel in the river from 2008 - 2016. Side channel modifications and habitat structures (e.g., trees, trunks, rootwads, and willows) have also been used for additional habitat enhancement at select sites. Restoration work has had demonstrated success - juvenile fish densities have increased from only 0.1 fish per square meter to 3.25 fish per square meter in some reaches. Additionally, spawning increased approximately 500% from restoration actions. This ongoing gravel augmentation is integral to maintaining legal operation of the CVP and to supporting salmonid persistence in the lower American River. Many reports and studies have been completed in support of the restoration project.<sup>9</sup>

In 2016, the Lower American River Anadromous Fish Habitat Restoration Project proposed continued mitigation actions over the 16-year period from 2019 through 2034. The proposed actions were subject to a <u>2019 Environmental Assessment</u> under the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). Restoration activities are anticipated to be completed at up to three sites per year through 2034. Following an adaptive management approach, specific restoration sites for a given year are selected based on the results of ongoing monitoring directed by the Water Forum.

A video of the 2019 Sailor Bar gravel restoration can be found <u>here</u> and a video of spawning salmon from November and December 2015 at Sailor Bar, Sunrise, and Nimbus Basin can be found <u>here</u>.

<sup>&</sup>lt;sup>9</sup> https://www.fws.gov/lodi/instream-flow/instream\_flow\_reports.htm

## E. Shoreland and Watershed Protection

Criterion	Standard	Instructions			
Е	3	Enforceable Protection:			
		• Demonstrate that there is an approved and enforceable shoreline buffer			
		or equivalent watershed protection plan (including state or local			
		regulations) in place for conservation purposes, including buffered			
		shoreline along river corridors.			
		• In lieu of an existing shore land protection plan, provide documentation			
		that the facility commits to protect and not develop an equivalent land			
		area for conservation purposes as a condition of LIHI Certification, with			
		such commitment to be in effect for the duration of LIHI Certification.			

All Zones qualify for Standard E-3.

Lands associated with the Folsom powerhouse and spillway are approximately 215 acres. Lands associated with Nimbus dam, the Nimbus powerhouse, and fish hatchery facilities are approximately 53 acres. Surrounding land uses are highly developed adjacent to the projects, and include residential, commercial and industrial development as well as Folsom Prison located just downstream of Folsom Dam. The shorelands around Folsom Lake and Lake Natoma down to Nimbus Dam are part of the Folsom Lake State Recreation Area and protected for recreational uses (Figure 8).

The lower American River below Nimbus Dam is encompassed by the Sacramento County <u>American River Parkway</u>, an open space greenbelt which extends from Folsom Dam to the confluence with the Sacramento River. A <u>Parkway Plan</u> was adopted in the County's General Plan and was written into state statute in 2009 as the <u>Urban American River Parkway</u> <u>Preservation Act</u>.

The Parkway Plan serves to preserve the river and surrounding riparian zone for recreation, habitat, and cultural and historic resources. The lower American River is also classified as a "Recreation" river within the State and Federal Wild and Scenic River Systems, and the Parkway Plan serves as a guide for other local, state and federal agencies with authority within the American River Parkway under the Wild and Scenic Rivers Act and the Urban American River Parkway Preservation Act.



Figure 8. Folsom Lake State Recreation Area<sup>10</sup>

<sup>&</sup>lt;sup>10</sup> Source: <u>https://s3.amazonaws.com/img.stateparkhq.com/files/FolsomLakeFinalWebLayout061016.pdf</u>

## F. Threatened and Endangered Species Protection

Criterion	Standard	Instructions			
F	3	Recovery Planning and Action:			
		• If listed species are present, document that the facility is in compliance with relevant conditions in the species recovery plans, incidental take permits or statements, biological opinions, habitat conservation plans, or similar government documents.			
		• Document that any incidental take permits and/or biological opinions currently in effect were designed as long-term solutions for protection of listed species in the area.			

All Zones qualify for Standard F-3.

There is a consolidated recovery plan in place for the listed <u>Sacramento River winter-run</u> <u>Chinook salmon, Central Valley spring-run Chinook salmon, and the distinct population segment</u> (<u>DPS</u>) of the California Central Valley steelhead. Winter-run chinook has critical habitat in the lower Sacramento River, but not in the American River. Spring-run chinook has critical habitat in the American River but only downstream of Nimbus dam. Steelhead has critical habitat up to Nimbus dam.

NMFS designates the lower American River to contain Essential Fish Habitat (EFH) for Chinook salmon, as defined by the Magnuson-Stevens Fisheries Conservation and Management Act of 1994. EFH refers to those waters and substrates necessary for spawning, breeding, feeding, or growth to maturity. Freshwater EFH for salmon consists of four major components: spawning and incubation habitat; juvenile rearing habitat; juvenile migration corridors; and adult migration corridors and adult holding habitat.<sup>11</sup>

The green sturgeon southern DPS and its critical habitat extends up into the American River about 4 miles, well downstream of Nimbus dam, but the species also has a <u>recovery plan</u> in place.

A <u>Biological Opinion</u> was issued in 2009 for operations of the CVP and State Water Project (SWP) that could affect listed fish species. In 2016, Reclamation requested re-initiation of Endangered Species Act Section 7 consultation with FWS and NMFS on the coordinated long term operation of the CVP and SWP in light of newer information on the status of listed species, new information on recent drought years, and the evolution of best available science. That consultation resulted in a subsequent <u>Biological Opinion</u> in 2019.

The projects are in compliance with the recovery plans and Biological Opinions as discussed in Sections 3.C and 3.D above.

<sup>&</sup>lt;sup>11</sup> https://www.usbr.gov/mp/nepa/includes/documentShow.php?Doc\_ID=24637

Reclamation's <u>2016 Environmental Assessment for the Lower American River Anadromous Fish</u> <u>Habitat Restoration Project</u> below Nimbus Dam included listed species. The following are rare and listed plants with recorded occurrences in the broad area surrounding the projects:

- Sacramento Orcutt grass (Orcuttia viscida) Federal and State endangered
- Slender Orcutt grass (Orcuttia tenuis) Federal threatened and State endangered
- Boggs Lake hedge-hyssop (Gratiola heterosepala) State endangered

Additional plant species located above Folsom Dam include:

- El Dorado Bedstraw (Galium californicum sierrae) Federal endangered and State rare
- Layne's Ragwort (Senecio layneae) Federal threatened and State rare
- Pine Hill Ceanothus (Ceanothus roderickii) Federal endangered and State rare
- Pine Hill Flannelbush (Fremontodendron californicum decumbens) Federal endangered and State rare
- Stebbins' Morning-glory (Calystegia stebbinsii) Federal and State endangered

Table 4 below includes Federal listed species in the area and the determination of effects due to the restoration project. As noted in the table, critical habitats (denoted by X) exist downstream of Nimbus Dam for two shrimp species, the valley elderberry longhorn beetle, steelhead, and spring-run Chinook. All species were determined not to be adversely affected by the project (denoted by NE), or not likely to be affected with environmental protection measures (NLAA).

<u>Common</u> Name	<u>Scientific Name</u>	Status <sup>1</sup>	Effect <sup>2</sup>	Summary of Effects Determination <sup>3</sup>
<b>Invertebrate</b> s	·	· ·	· .	
Conservancy	Branchinecta	Е	NE	Occurences <sup>4</sup> and Critical Habitat outside
fairy shrimp	conservatio			of the Project area. Occurs only in vernal
Vernal pool	Branchinecta	Т, Х	NE	pools and swales. Vernal pools located
fairy shrimp	lynchi			approximately 1 mile south of the LAR
Vernal pool	Lepidurus	Е, Х	NE	near Mather Airport. Unlikely to occur
tadpole shrimp	packardii			due to lack of suitable habitat.
Valley	Desmocerus	Т, Х	NLAA	Elderberry shrubs are present along the
elderberry	californicus			river corridor. No elderberry shrubs
longhorn beetle	dimorphus			would be disturbed.
Birds				
Western	Coccyzus	Т	NLAA	Proposed Critical Habitat is the Sutter
yellow-billed	americanus			Bypass. No suitable breeding habitat.
cuckoo	occidentalis			
Least Bell's	Vireo bellii	Е	NE	Historically, the northern end of
vireo	pusillus			distribution included Red Bluff.
				Currently distribution is limited to
				southern California (USFWS 1998).
Amphibians				
California tiger	Ambystoma	Т	NE	Found in annual grasslands, grass
salamander	californiense			understory of valley foothill woodland,
				and uncommonly along streams. Breed
				and lay eggs in vernal pools and other
				temporary ponds. Unlikely to occur due
				to lack of suitable habitat.

Table 4. Listed Species Potentially Affected by Restoration Project

<u>Common</u> Name	Scientific Name	Status <sup>1</sup>	Effect <sup>2</sup>	Summary of Effects Determination <sup>3</sup>
California red- legged frog	Rana draytonii	Т	NE	Red-legged frogs require variety of habitat types including aquatic, riparian and upland areas. Adults often utilize dense, shrubby or emergent vegetation closely associated with deep-water pools with fringes of cattails and dense stands of overhanging vegetation such as willows.
Reptiles	1	T		I.
Giant garter snake	Thamnophis gigas	Т	NE	The giant garter snake inhabits marshes, sloughs, ponds, small lakes, low-gradient streams, and other waterways and agricultural wetlands, such as irrigation and drainage canals and rice fields. Unlikely to occur due to lack of suitable habitat.
Fish			•	
Delta smelt	Hypomesus transpacificus	Т	NE	Occurs in Sacramento/San Joaquin Delta. No water quality impacts to the Delta
Green Sturgeon	Acipenser medirostris	Т	NE	
Central Valley steelhead	Oncorhynchus mykiss	Т, Х	NLAA	
Central Valley spring-run Chinook Salmon	Oncorhynchus tshawytscha	Т, Х	NLAA	Biological Assessment sent to NMFS and Biological Opinion received.
Winter-run Chinook Salmon	Oncorhynchus tshawytscha	Е	NLAA	

1 Status = Listing of Federally special status species

E: Endangered; T: Threatened; X: Designated Critical Habitat

2 Effects = Effect determination

NE: No Effect to federally listed species anticipated from the Proposed Action.

NLAA: Not Likely to Adversely Affect with Environmental Protection Measures

3 Summary of rationale supporting determination

4 California Natural Diversity Database 2014 recorded occurrences in the surrounding 18 Quads

A subsequent 2019 Environmental Assessment for additional restoration work identified five bird species in addition to those listed above that are present or likely to be present (see Appendix 3, Table 3, pp. 7-10) including bald eagle, (state endangered), Swainson's hawk and bank swallow (state threatened), and white tailed kite and golden eagle (state protected). Several mitigation measures were identified to reduce impacts to all listed fish, wildlife and plant species to less than significant, including oil spill and erosion control measures; working outside of fish spawning seasons; fencing, road wetting and identification measures for the valley elderberry longhorn beetle; bird surveys and nest buffers; and wetlands protection measures.

## G. Cultural and Historic Resources Protection

Criterion	Standard	Instructions
G	2	Approved Plan:
		• Provide documentation of all approved state, federal, and recognized tribal plans for the protection, enhancement, and mitigation of impacts to cultural and historic resources affected by the facility.
		• Document that the facility is in compliance with all such plans.

All Zones qualify for Standard G-2.

As a Federal agency, any undertaking with the potential to cause effects to cultural or historic resources and Indian trust assets<sup>12</sup> is subject to review under Section 106 of the National Historic Preservation Act (NHPA). The California Environmental Quality Act (CEQA) also requires that projects financed or approved by public agencies be assessed for cultural and historic resources.

As a result, cultural and historic resources have been surveyed several times over the life of the projects. Much of the area around Folsom Dam including the dikes, shoreline and recreation areas was heavily disturbed at the time of construction in the 1950s. The <u>1996 American River</u> <u>Watershed Project</u> to improve flood protection measures in the American River basin included cultural resources surveys that identified 42 archaeological sites, 7 historic properties determined to be eligible for the National Register, and 3 potentially eligible railroad bridges. At least 123 prehistoric sites and approximately 52 historic properties were recorded at Folsom Reservoir.

A cultural resources Programmatic Agreement (PA) was executed at that time between USACE, the State Office of Historic Preservation (SHPO) and the Advisory Council on Historic Preservation. Other signatories included the US Bureau of Reclamation, the State of California, and the Sacramento Area Flood Control Agency. The PA included procedures for treatment of direct and indirect impacts of improvements associated with the project and included mitigations such as evaluation of eligibility for listing, documentation of cultural and historic resources that could be impacted, and development of Historic Properties Treatment Plans.

Cultural and historic resources were also evaluated as part of the Lower American River Anadromous Fish Habitat Restoration Program in 2009 and 2015. A Memorandum of Agreement was executed between Reclamation and the SHPO in 2010 and the mitigation stipulations were met and concurred with by SHPO in 2012. The SHPO concurred on September 21, 2015 with a no effect determination for the proposed work beyond 2015.

<sup>&</sup>lt;sup>12</sup> Indian trust assets are legal interests in property held in trust by the United States for federally recognized Indian tribes or individual Indians.

More recently, as part of the Folsom Spillway project completed in 2017, USACE conducted a literature review and limited field surveys of cultural and historic resources, detailed in the project's <u>Final Supplemental Environmental Impact Statement</u>. It was determined that Folsom Dam and its right and left wing dams were eligible for listing.<sup>13</sup>

The Nimbus Fish Hatchery complex does not qualify as a historic resource. The State Historic Preservation Office concurred with this determination on <u>September 7, 2010</u> as part of the fish ladder replacement project.

In all cases, as specific program activities are identified, Reclamation would comply with Section 106 of the NHPA as required, prior to implementation of projects and will consult with the SHPO at all sites. In the event of an unanticipated archaeological discovery, the operations would immediately cease in the vicinity of the discovery and Reclamation's cultural resource staff would be contacted immediately. Reclamation's cultural resource staff would assess the discovery, conduct any required notifications and consultations, and provide direction on how to proceed.

As noted in Section 3.C above, the original "Old Folsom Dam" was completed in 1893. This is the most significant historical resource in the project vicinity but is not part of the current projects. The original dam's construction began in 1867 for logging purposes by Horatio Gates Livermore who came from Maine and saw the possibilities of the American River for logging and for development of waterpower to operate sawmills and other industrial plants. He envisioned an industrial city at Folsom similar to Lowell, Massachusetts, where water wheels had long been used to operate mills and factories. However, in the late 1880s, Livermore began to realize that instead of using waterpower as a direct motive force, the water could turn generators for electricity in Sacramento, 22 miles downstream. Up to that time power had never been transmitted more than about five miles but Livermore persuaded manufacturers to design a workable system.

The first log reached the prison dam in 1891, a year after logging began. In 1892 he incorporated the Sacramento Electric Power and Light Company to build the powerhouse and construct the long-distance power line and a distribution station in the Capital City.<sup>14</sup> Folsom Prison inmates had been called upon to help install granite blocks dug up from the prison grounds for the dam which is located on Folsom Prison property about 0.75 miles downstream of the current Folsom dam.

The powerhouse located further downstream began operations in 1895 and is now a <u>State</u> <u>Historic Park</u> (SHP) associated the Folsom Lake State Recreation Area. The SHP is 35 acres in size, about half the unit is state-owned property and the other half is under U.S. Bureau of Reclamation ownership and managed by State Parks through a lease agreement. The SHP is

<sup>&</sup>lt;sup>13</sup> A discussion of cultural resources along the American River is included in the American River Watershed, California, Long-Term Study Final Supplemental Plan Formulation Report/Environmental Impact Statement/Environmental Impact Report, Volume II: Appendix A, Attachment 1, Appendix 1E (Corps2002). A more recent and geographically specific discussion of cultural resources around Folsom Dam is included in the 2007 FEIS/EIR(USBR2007a), as well as the "Cultural Resources Literature Search, Inventory, and National Register Evaluation for the Folsom Dam Safety and Flood Damage Reduction EIS/EIR" completed by Pacific Legacy, Inc. in 2007.

<sup>&</sup>lt;sup>14</sup> https://www.parks.ca.gov/?page\_id=1340

managed jointly under Reclamation's Resource Management Plan and the State's <u>Folsom Lake</u> <u>Recreation Area and Folsom Powerhouse General Plan/Resource Management Plan</u>.

Ruins of the dam and canal still exist (Figure 9) and the powerhouse is listed on the <u>National</u> <u>Register of Historic Places</u> and listed as California Historical Landmark, National Historic Landmark, National Historic Civil Engineering Landmark, and National Historic Mechanical Engineering Landmark. It is also located adjacent to the Historic District of the City of Folsom. Folsom Powerhouse SHP provides tours, exhibits, and interactive activities that explore the history of hydro-electric generation and transmission of electricity.

The Old Folsom powerhouse represents one of the oldest hydroelectric facilities in the world and the nation's first power system to provide high-voltage alternating current over long distance transmission lines. The historic structures that form the core of the SHP include the main powerhouse and turbine room, the pump room, transformers and switches, the lower powerhouse, the blacksmith shop, forebay, spillways and about one half mile of the canal that once brought water to the powerhouse from the original Folsom Dam.<sup>15</sup>

An interesting video of the old dam can be found here and a historical overview is found here.



## Figure 9. Original Folsom Dam<sup>16</sup>

<sup>&</sup>lt;sup>15</sup> https://www.parks.ca.gov/pages/21299/files/FLSRA\_GP\_RMP\_Vol1\_Final\_Plan.pdf

<sup>&</sup>lt;sup>16</sup> Source: <u>https://www.kcra.com/article/the-history-behind-the-granite-walls-of-folsom-state-prison-1/13135305</u>

### **H. Recreational Resources**

Criterion	Standard	Instructions
Н	1	Not Applicable / De Minimis Effect:
		• Document that the facility does not occupy lands or waters to which public access can be granted and that the facility does not otherwise impact recreational opportunities in the facility area.

All Zones qualify for Standard H-3.

Access to areas directly surrounding the Folsom and Nimbus hydro facilities is gated and fenced, and generally restricted to facility staff. Pre-arranged tours of Folsom dam are provided, and the <u>American River Water Education Center</u> provides interactive exhibits, picnicking, gardens, and outdoor exhibits on solar power, xeriscape and outdoor conservation techniques.

The <u>Nimbus Fish Hatchery</u> and visitor center is operated by CDFW. The <u>Folsom Lake State</u> <u>Recreation Area</u> is managed by the California Department of Parks and Recreation, and provides myriad recreational opportunities and amenities including hiking, biking, running, camping, picnicking, horseback riding, water-skiing, boating, fishing, marinas, and campgrounds.

There are many other public recreational resources available in the project vicinity. The Lower American River is a 23-mile reach of American River, flowing from the base of Lake Natoma at the Nimbus Dam to the confluence with the Sacramento River. This stretch of river is the most used recreational river in California and is the highlight of the <u>American River Parkway</u>. The Parkway offers numerous recreational opportunities including rafting, fishing, swimming, biking, walking, and outdoor education. The park also includes Lake Natoma, downstream from Folsom Lake, which is popular for crew races, sailing, kayaking and other aquatic sports. Lake Natoma is primarily managed for non-motorized and slow-speed aquatic recreation such as rowing, paddling, etc. There is a 5-mph speed limit enforced on the entire lake.

There is a 32-mile long American River Bike Trail (a.k.a. Jedediah Smith Memorial Trail) that connects Folsom Lake and runs along the west side of the river, crosses near the fish hatchery and continues through many Sacramento County parks before reaching Old Sacramento. On the river's east side is the East Lake Natoma Trail that runs along the lake to the dam. A trail map can be found <u>here</u>.

The Folsom Powerhouse State Historic Park includes a small visitor center and tours are provided.

### **Contacts Forms**

### A. Applicant-related contacts

Facility Owner:					
Name and Title	United States Bureau of Reclamation				
Company	Central California Operations Office, Kristin White, Operations Manager				
Phone	(916) 979-2180				
Email Address	knwhite@usbr.gov				
Mailing Address	3310 El Camino Ave, Suite 300, Sacramento, CA 95821				
Facility Operator	(if different from Owner):				
Name and Title	United States Bureau of Reclamation				
Company	Central California Operations Office, Steve Melavic, Power Operations Division				
Phone	(916) 979-3001				
Email Address	smelavic@usbr.gov				
Mailing Address	7794 Folsom Dam Road, Folsom, CA 95630				
Consulting Firm	Agent for LIHI Program (if different from above):				
Name and Title	Bruce McLaughlin				
Company	Power & Water Resources Pooling Authority				
Phone	(916) 531-5566				
Email Address	bcm@cameron-daniel.com				
Mailing Address	3514 W. Lehman Road, Tracy, CA 95304				
<b>Compliance Cont</b>	act (responsible for LIHI Program requirements):				
Name and Title	Bruce McLaughlin				
Company	Power & Water Resources Pooling Authority				
Phone	(916) 531-5566				
Email Address	bcm@cameron-daniel.com				
Mailing Address	3514 W. Lehman Road, Tracy, CA 95304				
Party responsible for accounts payable:					
Name and Title	Bruce McLaughlin				
Company	Power & Water Resources Pooling Authority				
Phone	(916) 531-5566				
Email Address	bcm@cameron-daniel.com				
Mailing Address	3514 W. Lehman Road, Tracy, CA 95304				

B. Current and relevant state, federal, and tribal resource agency contacts with knowledge of the						
Agency Contact (	Check areas of responsibility: Flows_X_, Water Quality _X_, Fish/Wildlife					
Resources , Watersheds , T/E Spp. , Cultural/Historic Resources , Recreation ):						
Agency Name	Agency Name United States Bureau of Reclamation					
Name and Title	Central California Operations Office, Kristin White, Operations Manager					
Phone	(916) 979-2180					
Email address	knwhite@usbr.gov					
Mailing Address	3310 El Camino Ave, Suite 300, Sacramento, CA 95821					
Agency Contact (	Check areas of responsibility: Flows, Water Quality, Fish/Wildlife					
Resources _X_, W	/atersheds, T/E Spp, Cultural/Historic Resources, Recreation):					
Agency Name	United States Fish & Wildlife Service					
Name and Title	Cesar Blanco					
Phone	(916) 978-6190					
Email address	Cesar_blanco@fws.gov					
Mailing Address	2800 Cottage Way, Room W-2605, Sacramento, CA 95825					
Agency Contact (	Check areas of responsibility: Flows, Water Quality _x_, Fish/Wildlife					
Resources, Wa	atersheds, T/E Spp, Cultural/Historic Resources, Recreation):					
Agency Name	State Water Resources Control Board					
Name and Title	Jonathan Bishop, Chief Deputy Director					
Phone	(916) 341-5820					
Email address	Jonatahn.bishop@waterboards.ca.gov					
Mailing Address	ailing Address P.O. Box 100, Sacramento, CA 95812-0100					
Agency Contact (	Agency Contact (Check areas of responsibility: Flows, Water Quality , Fish/Wildlife					
Resources _x_, W	<pre>/atersheds, T/E Spp, Cultural/Historic Resources, Recreation):</pre>					
Agency Name	California Department of Fish & Wildlife					
Name and Title	Kevin Shaffer, Branch Chief, Fisheries Branch					
Phone	(916) 376-1689					
Email address	Kevin.shaffer@wildlife.ca.gov					
Mailing Address	1010 Riverside Parkway, West Sacramento, CA 95605					
Agency Contact (	Check areas of responsibility: Flows, Water Quality, Fish/Wildlife					
Resources , Wa	atersheds , T/E Spp. , Cultural/Historic Resources x , Recreation x ):					
Agency Name	California Department of Parks and Recreation					
Name and Title	Natural Resources Division					
Phone	(916) 653-6725					
Email address						
Mailing Address	P.O. Box 9422896, Sacramento, CA 94296					
Agency Contact (Check areas of responsibility: Flows , Water Quality , Fish/Wildlife						
Resources , Watersheds , T/E Spp. , Cultural/Historic Resources , Recreation ):						
Agency Name	Western Area Power Administration					
Name and Title	Sonja Anderson, Regional Manager					
Phone	(916) 353-4454					
Email address	sanderso@wapa.gov					
Mailing Address	114 Parkshore Dr, Folsom, CA 95630					

## C. Current stakeholder contacts that are actively engaged with the facility

<b>Stakeholder Contact</b> (Check areas of interest: Flows_x_, Water Quality _x_, Fish/Wildlife						
Resources _x_, Watersheds _x_, T/E Spp, Cultural/Historic Resources, Recreation _x_):						
Stakeholder	Sacramento Water Forum					
Organization						
Name and Title	Lilly Allen					
Phone	(916) 808-1993					
Email address	lallen@cityofsacramento.org					
Mailing Address	1330 21 <sup>st</sup> St., Sacramento, CA 95811					
Stakeholder Cont	tact (Check areas of interest: Flows, Water Quality, Fish/Wildlife					
Resources, Wa	atersheds, T/E Spp, Cultural/Historic Resources, Recreation):					
Stakeholder						
Organization						
Name and Title						
Phone						
Email address						
Mailing Address						
Stakeholder Cont	tact (Check areas of interest: Flows, Water Quality, Fish/Wildlife					
Resources, Wa	atersheds, T/E Spp, Cultural/Historic Resources, Recreation):					
Stakeholder						
Organization						
Name and Title						
Phone						
Email address						
Mailing Address						
Stakeholder Cont	t <b>act</b> (Check areas of interest: Flows, Water Quality, Fish/Wildlife					
Resources, Wa	atersheds, T/E Spp, Cultural/Historic Resources, Recreation):					
Stakeholder						
Organization						
Name and Title						
Phone						
Email address						
Mailing Address						

## **5.0 SWORN STATEMENT**

As an Authorized Representative of the U.S. Bureau of Reclamation, the Undersigned attests that the material presented in the application is true and complete.

The Undersigned acknowledges that the primary goal of the Low Impact Hydropower Institute's certification program is public benefit, and that the LIHI Governing Board and its agents are not responsible for financial or other private consequences of its certification decisions.

The Undersigned further acknowledges that if LIHI Certification of the applying facility is granted, the LIHI Certification Mark License Agreement must be executed prior to marketing the electricity product as LIHI Certified<sup>®</sup>.

The Undersigned further agrees to hold the Low Impact Hydropower Institute, the Governing Board and its agents harmless for any decision rendered on this or other applications, from any consequences of disclosing or publishing any submitted certification application materials to the public, or on any other action pursuant to the Low Impact Hydropower Institute's certification program.

Company Name: <u>U.S. Bureau of Reclamation</u> Authorized Representative:

Name: Drew Lessard

Title:	Area Manage	er, Central-C	alifornia	Area (	Offic,	Bureau	of Rec	lamation,	Interior	Regior	<u>110,</u>
Califor	nia-Great Bas	sin									

Authorized Signature: DREW LESSARD Digitally signed by DREW LESSARD Date: 2021.03.31 12:21:40

# Appendix 1

Dam	Owner	River Mile/Location
Brush Creek	SMUD	Brush Creek, South Fork American
Caples Lake Dam &	PG&E	Caples Creek, South Fork American
Aux Dam		
Loon Lake Dam and	SMUD	Gerle Creek & Rocky Basin Creek, Middle Fork
Aux Dam		American
Gerle	SMUD	Gerle Creek, Middle Fork American
Stumpy Meadows	Georgetown	Pilot Creek, Middle Fork American
(Mark Edison)	Divide PUD	
Hell Hole	Placer	Rubicon River, Middle Fork American
	County	
	Water	
	Authority	
Buck Island	SMUD	Rubicon River, Middle Fork American
Rubicon	SMUD	Rubicon River, Middle Fork American
Sugar Pine	USBR	Shirttail Creek, North Fork American
Junction	SMUD	Silver Creek, South Fork American
Union Valley	SMUD	Silver Creek, South Fork American
Silver Lake	PG&E	Silver Fork, South Fork American
Ice House Dam and	SMUD	South Fork of Silver Creek, South Fork American
Aux Dam		

# Appendix 2

Location and name of closest stream gauging stations above and below the facility: Data sourced from <u>https://cdec.water.ca.gov/river/americanStages.html</u> Upstream

Station ID	NFD	Elevation	715 ft
<b>River Basin</b>	AMERICAN R	County	PLACER
Hydrologic Area	SACRAMENTO RIVER	Nearby City	AUBURN
Latitude	38.936008°	Longitude	-121.023834°
Operator	US Geological Survey		
Station ID	OXB	Elevation	1070 ft
<b>River Basin</b>	AMERICAN R	County	PLACER
Hydrologic Area	SACRAMENTO RIVER	Nearby City	FORESTHILL
Latitude	39.006000°	Longitude	-120.760000°
Operator	Placer County Water Agency		
Station ID	CBR	Elevation	931 ft
<b>River Basin</b>	AMERICAN R	County	EL DORADO
Hydrologic Area	SACRAMENTO RIVER	Nearby City	PLACERVILLE
Latitude	38.772000°	Longitude	-120.816000°
Operator	Pacific Gas and Electric Company, Auburn		

Downstream - just downstream of Nimbus Dam

Station ID	AFO	Elevation	72 ft
<b>River Basin</b>	AMERICAN R	County	SACRAMENTO
Hydrologic Area	SACRAMENTO RIVER	Nearby City	FAIR OAKS
Latitude	38.635460°	Longitude	-121.227730°
Operator	US Geological Survey		

# Appendix 3

Appendix G in https://www.usbr.gov/mp/ nepa/includes/documentShow.php? Doc\_ID=40955



March 25, 2019

Geotechnical

Ecological

Environmental

Water Resources

Lilly Allen Sacramento Water Forum 915 I Street Sacramento, CA 95814

Subject: Biological Resources Technical Report for the Lower American River Spawning Gravel Augmentation and Habitat Improvement Project

Dear Ms. Allen:

The City of Sacramento (City) is conducting studies to support the Lower American River Spawning Gravel Augmentation and Habitat Improvement Project (proposed action or proposed project). GEI Consultants, Inc. (GEI) conducted a desktop investigation of the proposed restoration sites and borrow sites and analysis of potential significant impacts of the project on biological resources. This letter report describes habitat types present on the restoration and borrow sites, including potential waters of the United States; evaluates habitat suitability and potential for special-status species to occur on, or adjacent to, the restoration and borrow sites; and evaluates potential for special-status species and sensitive habitats to be significantly impacted by implementing the proposed action.

## **Project Location**

The proposed action would be implemented at various sites on the lower American River, below Lake Natoma and above the confluence with the Sacramento River, from approximately River Mile (RM) 23 downstream to RM 13, in Sacramento County (**Attachment A, Figure 1**). The restoration and borrow sites are on the Folsom, Citrus Heights, and Carmichael 7.5-minute U.S. Geological Survey (USGS) Quadrangles, Township 9 North, Range 6 and 7 East (**Attachment A, Figure 2**).

## **Desktop Investigation**

The desktop investigation included review of existing documentation for prior gravel augmentation in the lower American River, completed by the City of Sacramento (City), Sacramento Area Water Forum (Water Forum) and U.S. Department of the Interior, Bureau of Reclamation (Reclamation), and other available sources of information on biological resources in the project vicinity.

The California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB) (CDFW 2019) and the California Native Plant Society (CNPS) online Inventory of Rare and Endangered Vascular Plants of California (CNPS 2019) were reviewed. These reviews were centered on the Folsom, Citrus Heights, and Carmichael USGS 7.5-minute quadrangles and included the eight surrounding quadrangles. Database search results are provided in **Attachment B**. A list of resources under jurisdiction of the U.S. Fish and Wildlife Service (USFWS) that could occur in the project vicinity was obtained from the USFWS Information for Planning and Conservation (IPaC) website (USFWS 2019a), and the National Marine Fisheries Service (NMFS) California Species List Tools (NMFS 2018) was queried for Federally listed anadromous fish populations have been documented in the Folsom, Citrus Heights, or Carmichael USGS

quadrangle. The IPaC and NMFS resource lists are provided in **Attachment B**. Aerial imagery on Google Earth®, National Wetlands Inventory data, and the Natural Resources Conservation Service *Soil Survey of Sacramento County, California* (NRCS 2017) also were reviewed.

## **Environmental Setting**

Elevation of the project study area ranges from approximately 50 feet above mean sea level at the downstream end of the River Bend restoration site to approximately 200 feet at the upstream end of the Mississippi Bar borrow site (**Attachment A, Figure 2**).

## Habitat Types

Habitat types on the restoration sites include valley oak woodland, mixed riparian forest, and willow scrub. The borrow sites are primarily barren and composed of dredge tailings. The habitat descriptions below are based on the wetland delineation report prepared for the *Lower American River Anadromous Fish Habitat Restoration Program* (Reclamation 2015) and the *American River Gravel Augmentation Project* (Water Forum 2008). The American River flows through the restoration sites and is described below under "Sensitive Habitats". Seasonal wetland habitats were previously identified in dredge tailing piles on the borrow sites and are also described below under "Sensitive Habitats".

## Valley Oak Woodland

Valley oak woodland is typically common on floodplain terraces higher and farther from the main channel than other riparian plant communities. Mature valley oaks (*Quercus lobata*) dominate this plant community. Oak spacing is variable, ranging from open to closed canopy. The mature oaks range from medium to large, approximately 15–35 meters tall. Below the open oak canopy, the grass and forb understory is often dominated by creeping rye grass (*Leymus triticoides*) and nonnative invasive grasses. Shrubs interspersed among the oaks may include blue elderberry (*Sambucus nigra* ssp. *caerulea*), coyote brush (*Baccharis salicifolia*), and poison oak (*Toxicodendron diversilobum*). Riparian trees are infrequent, but may include box elder (*Acer negundo*), Oregon ash (*Fraxinus latifolia*), and Fremont cottonwood (*Populus fremontii*).

## Mixed Riparian Forest

Low on the floodplain and close to the main channel, valley oak woodland transitions to mixed riparian forest. In mixed riparian forest, very tall oaks are less common, and the frequency of sapling oaks is higher. A mid-story canopy layer is present and composed of medium-sized trees and tall shrubs, such as western sycamore (*Platanus racemosa*) and box elder. The understory contains a greater proportion of smaller shrubs than in valley oak woodland. Mixed riparian forest along the lower American River is dominated by mature cottonwoods, Oregon ash, box elder, black willow (*Salix gooddingii*), and red willow (*S. laevigata*). Willow shrubs, including narrowleaf (*S. exigua*) and arroyo (*S. lasiolepis*) willows, may also be present but are most frequently encountered near the top of the channel bank. Where there are openings in the overstory, dense patches of California mugwort (*Artemisia douglasiana*) and California wild rose (*Rosa californica*) may form. Canopy openings also provide suitable habitat for aggressive vines such as Himalayan blackberry (*Rubus armeniacus*) and native California grape (*Vitis californica*).

## Willow Scrub

Along the top of the channel bank, mixed riparian forest becomes dominated by willows, as the frequency and duration of flooding increases. Willow scrub communities are composed of young, newly established willows and cottonwoods that can survive the frequent physical battering and flood inundation. Narrowleaf willow is common along the channel edge and forms dense thickets on in-channel point bars. The presence of willows allows fine sediments to accumulate and

additional riparian plants to establish. Willow scrub communities are early successional habitats because they are the first plant communities to form on newly established point bars along rivers and require disturbance for seed germination.

## Fish and Wildlife

Fish and wildlife populations that use the lower American River and associated riparian corridor have been highly altered by past levee construction, urban and suburban development, and other land use conversions. Most of the American River floodplain and its riparian habitats, permanent and seasonal wetlands, and oak woodlands and savannas had been lost, and the wide diversity and large numbers of associated native fish and wildlife species have been greatly reduced. The abundance of species restricted to natural habitats has decreased, and in some cases particular species are no longer found. However, the remnant native habitats of the American River Parkway have allowed some fish and wildlife populations to persist. The project study area provides habitat for many common birds, amphibian, reptiles, and mammals, particularly those that are able to use the narrow corridors of remnant natural vegetation. Wider portions of the parkway and areas with more diversity in native habitat types and vegetation structure likely to support a greater diversity of wildlife species.

A variety of fish species are known or have potential to occur in the lower 23 miles of the American River from Nimbus Dam to the Sacramento River, including backwaters and dredge ponds (**Table 1**). Approximately half of these species are game fish.

Common Name	Scientific Name	Origin
Lamprey (two species)	Lampetra spp.	Native
Chinook Salmon (winter, spring, fall, and late fall runs)	Oncorhynchus tshawytscha	Native
Chum salmon	Oncorhynchus keta	Native
Steelhead/rainbow trout	Oncorhynchus mykiss	Native
White sturgeon	Acipenser transmontanus	Native
Green sturgeon	Acipenser medirostris	Native
Delta smelt	Hypomesus transpacificus	Native
Wakasagi	Hypomesus nipponensis	Nonnative
Sacramento sucker	Catostomus occidentalis	Native
Sacramento pikeminnow	Ptychocheilus grandis	Native
Sacramento splittail	Pogonichthys macrolepidotus	Native
Sacramento blackfish	Orthodon microlepidotus	Native
Hardhead	Mylopharodon conocephalus	Native
Speckled dace	Rhinichthys osculus	Native
California roach	Lavinia symmetricus	Native
Hitch	Lavinia exilicauda	Native
Golden shiner	Notemigonus crysoleucas	Nonnative
Fathead minnow	Pimephales promelas	Nonnative
Goldfish	Carassius auratus	Nonnative
Carp	Cyprinus carpio	Nonnative
Threadfin shad	Dorosoma petenense	Nonnative

## Table 1.Central Valley Native and Nonnative Fish Species with Potential to<br/>Occur in the Lower American River

Common Name	Scientific Name	Origin
American shad	Alosa sapidissima	Nonnative
Black bullhead	Ameiurus melas	Nonnative
Brown bullhead	Ameiurus nebulosus	Nonnative
White catfish	Ameiurus catus	Nonnative
Channel catfish	Ictalurus punctatus	Nonnative
Mosquito fish	Gambusia affinis	Nonnative
Inland silverside	Menidia audena	Nonnative
Threespine stickleback	Gasterosteus aculaetus	Native
Striped bass	Morone saxatilis	Nonnative
Bluegill	Lepomis macrochirus	Nonnative
Green sunfish	Lepomis cyanellus	Nonnative
Redear sunfish	Lepomis microlophus	Nonnative
Warmouth	Lepomis gulosus	Nonnative
White crappie	Pomoxis annularis	Nonnative
Black crappie	Pomoxis nigromaculatus	Nonnative
Largemouth bass	Micropterus salmoides	Nonnative
Redeye bass	Micropterus coosae	Nonnative
Spotted bass	Micropterus punctulatus	Nonnative
Small mouth bass	Micropterus dolomieu	Nonnative
Bigscale logperch	Percina macrolepida	Nonnative
Prickly sculpin	Cottus asper	Native
Tule perch	Hysterocarpus traski	Native
Source: Spider B and R G Titus 2000		

#### Table 1. Central Valley Native and Nonnative Fish Species with Potential to Occur in the Lower American River

Source: Snider, B., and R.G. Hitus. 20

## Sensitive Biological Resources

Sensitive biological resources addressed in this assessment include those that are afforded consideration or protection under the California Environmental Quality Act (CEOA), California Fish and Game Code (FGC), California Endangered Species Act (CESA), Federal Endangered Species Act (ESA), Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), Clean Water Act (CWA), and Porter-Cologne Water Quality Control Act (Porter-Cologne Act).

## **Special-status Species**

For the purposes of this assessment, special-status species include plants and animals that fall into any of the following categories:

- species officially listed by the Federal government or the State of California as endangered, threatened, or rare;
- candidate species for Federal or State listing as endangered or threatened;
- species proposed for Federal or State listing as endangered or threatened; •
- taxa (i.e., taxonomic categories or groups) that meet the criteria for listing;

- wildlife species identified by CDFW as species of special concern and plant taxa considered by CDFW to be "rare, threatened, or endangered in California;"
- species listed as Fully Protected under the FGC; or
- species afforded protection under local or regional planning documents.

Plant taxa are assigned by CDFW to one of the following six California Rare Plant Ranks (CRPRs):

- CRPR 1A—Plants presumed to be extinct in California;
- CRPR 1B—Plants that are rare, threatened, or endangered in California and elsewhere;
- CRPR 2A—Plants that are presumed extirpated in California, but are more common elsewhere;
- CRPR 2B—Plants that are rare, threatened, or endangered in California but more common elsewhere;
- CRPR 3—Plants about which more information is needed (a review list); or
- CRPR 4—Plants of limited distribution (a watch list).

All plants with a CRPR are considered "special plants" by CDFW. The term "special plants" is a broad term used by CDFW to refer to all plant taxa inventoried in the CNDDB, regardless of their legal or protection status. As indicated above, only plant taxa considered by CDFW to be "rare, threatened, or endangered in California" (i.e., CRPR 1B and 2B plants) are considered special-status for purposes of this analysis. CDFW applies the term "California species of special concern" to fish and wildlife species that are not listed under CESA but that are nonetheless declining at a rate that could result in listing, or that historically occurred in low numbers and are subject to current known threats to their persistence.

**Figure 3 and Figure 4** in **Attachment A** show all CNDDB occurrences of plant and wildlife species that meet the definition of special-status species described above that have been documented within 3 miles of the restoration and borrow sites. Results of the CNDDB search (see **Attachment B**) yielded occurrences of 21 special-status plants and animals in the Carmichael, Citrus Heights, and Folsom USGS quadrangles, 18 of which have been documented within 3 miles of the restoration and borrow sites. (Note: Not all species tracked in the CNDDB and included in the search results in Attachment B meet the definition of a special-status species described above.)

Eight fish and wildlife species and two plant species listed as "threatened" or "endangered" under ESA are included on the IPaC list. The NMFS species lists indicate that three Federally listed anadromous fish populations occur in the Folsom, Citrus Heights, and Carmichael USGS quadrangles.

## Special-status Plants

**Table 2** provides information on special-status plant species that were evaluated for potential to occur on the restoration or borrow sites. Species included in the CNDDB or CNPS search results, but that occupy elevation ranges higher or lower than the elevation of the restoration or borrow sites or otherwise could be determined to have no potential to occur in the project vicinity, were eliminated from consideration and are not included in Table 2. Based on the review of existing documentation and knowledge of the local setting, the potential for special-status plant species to occur within the restoration sites is limited to Sanford's arrowhead (*Sagittaria sanfordii*).

	Blooming	Status <sup>1</sup>			Potential to Occur on the		
Species	Period	Federal	State	Habitat Associations	Restoration or Borrow Sites		
Dwarf downingia pusilla	March– May	_	2B.2	Vernal pools and similar seasonal wetlands in valley and foothill grassland	None; no suitable habitat is present on the restoration or borrow sites.		
Boggs Lake hedge- hyssop Gratiola heterosepala	April– August	_	SE 1B.2	Lake margins and vernal pools on clay soils	None; no suitable habitat is present on the restoration or borrow sites.		
Ahart's dwarf rush Juncus leiospermus var. ahartii	March– May	_	1B.2	Vernal pool margins and swales in valley and foothill grassland, often on gopher mounds	None; no suitable habitat is present on the restoration or borrow sites.		
Legenere limosa	April– June	_	1B.1	Vernal pools	None; no suitable habitat is present on the restoration or borrow sites.		
Pincushion navarretia myersii ssp. myersii	April– May	_	1B.1	Vernal pools, often on acidic soils	None; no suitable habitat is present on the restoration or borrow sites.		
Slender Orcutt grass Orcuttia tenuis	May– September	FT	SE 1B.1	Vernal pools, often on gravelly soils	None; no suitable habitat is present on the restoration or borrow sites.		
Sacramento Orcutt grass Orcuttia viscida	April-July	FE	SE 1B.1	Vernal pools	None; no suitable habitat is present on the restoration or borrow sites.		
Sanford's arrowhead Sagittaria sanfordii	May– October	_	1B.2	Assorted shallow freshwater marshes and swamps; generally, occurs in standing or slow-moving freshwater ponds, marshes, ditches, and sloughs	Low; suitable habitat is restricted to slow moving or ponded water located off the main channel of the lower American River; nearest known occurrence is in a concrete lined drainage channel along the south bank of the river upstream of Ancil Hoffman Park.		

#### Table 2. Special-status Plants Evaluated for Potential to Occur on the Restoration or Borrow Sites

#### <sup>1</sup> Status Definitions

– = No status

Federal Status

FE = Listed as Endangered under the Federal Endangered Species Act

FT = Listed as Threatened under the Federal Endangered Species Act

#### State Status

SE = Listed as Endangered under the California Endangered Species Act

California Rare Plant Ranks

1B = Plant species considered rare or endangered in California and elsewhere

2B = Plant species considered rare or endangered in California but more common elsewhere

California Rare Plant Rank Extensions

.1 = Seriously endangered in California (greater than 80 percent of occurrences are threatened and/or have a high degree and immediacy of threat)

.2 = Fairly endangered in Ćalifornia (20 to 80 percent of occurrences are threatened and/or have a moderate degree and immediacy of threat)

Sources: CDFW 2019; CNPS 2019; USFWS 2019a; data compiled by GEI Consultants, Inc. in 2019

## Special-status Wildlife

**Table 3** provides information on special-status aquatic and terrestrial wildlife species that were evaluated for potential to occur on or adjacent to the restoration or borrow sites. Based on the review of existing documentation and knowledge of the local setting, a number of species are known to or have moderate to high potential to occur on or adjacent to the restoration and/or borrow sites.

## Table 3. Special-status Wildlife Evaluated for Potential to Occur on or Adjacent to the Restoration or Borrow Sites

	Stat	us	_	Potential to Occur on or Adjacent
Species	Federal State		Habitat Associations	Sites
Invertebrates				
Vernal pool fairy shrimp Branchinecta lynchi	FT	_	Vernal pools and other seasonal wetlands, typically small but including a wide range of sizes	Known to occur; one occurrence was documented in wetlands near dredge tailings at the Sailor Bar borrow site, near Illinois Avenue.
Valley elderberry longhorn beetle Desmocerus californicus dimorphus	FT	_	Closely associated with blue elderberry ( <i>Sambucus</i> sp.), which is an obligate host for the beetle larvae	Known to occur; suitable habitat is present and occurrences have been documented at multiple locations on or adjacent to the restoration sites; four sites between RM 14 and RM 17 are within designated critical habitat.
Vernal pool tadpole shrimp Lepidurus packardi	FE	-	Vernal pools and other seasonal wetlands, typically medium to large but including a wide range of sizes with relatively long inundation period	Moderate; could occur in wetlands in dredge tailings at the borrow sites, if these wetlands provide suitable habitat conditions.
Amphibians				
California red-legged frog Rana draytonii	FT	SSC	Lowlands and foothill streams, and marshes; requires permanent or late season sources of deep water with dense, shrubby, riparian, or emergent vegetation for breeding	None; no suitable habitat is present on or adjacent to the restoration or borrow sites.
Western spadefoot Spea hammondii	-	SSC	Vernal pools and other seasonal wetlands in valley and foothill grasslands	None; no suitable habitat is present on or adjacent to the restoration or borrow sites.

	Stat	Status		Potential to Occur on or Adjacent to the Restoration or Borrow		
Species	Federal	State	Habitat Associations	Sites		
Reptiles						
Western pond turtle Emys marmorata	- SSC A v nea boc wat hab upl wit of a		A variety of permanent or nearly permanent water bodies, typically deep water, in a wide range of habitats; nests in sunny upland habitats, typically within several hundred feet of aquatic habitat	Known to occur; American River provides suitable aquatic habitat; potential basking habitat occurs along the shorelines, and potential nesting habitat occurs in adjacent suitable uplands.		
Giant garter snake Thamnophis gigas	FT	ST	Freshwater marsh, agricultural wetlands, irrigation/drainage canals, sloughs, ponds, low gradient streams, and adjacent uplands	None; no suitable habitat is present on or adjacent to the restoration or borrow sites.		
Birds						
Tricolored blackbird Agelaius tricolor	_	CE, SSC	Nests in freshwater marsh, riparian scrub, grain crops, and other dense, low vegetation and forages in grasslands and agricultural fields	None; nesting colonies do not occur in willow scrub along the lower American River, and no other suitable habitat is present on or adjacent to the restoration or borrow sites.		
Grasshopper sparrow Ammodramus savannarum	_	SSC	Nests and forages in grasslands, with a mix of grasses, forbs, and scattered shrubs, on rolling hills and lowland plains	None; no suitable habitat is present on or adjacent to the restoration or borrow sites.		
Golden eagle Aquila chrysaetos	_	FP	Variety of habitats in foothills, mountains, high plains, and dessert; primarily nests on cliffs in steep canyons, but also in large trees in open areas	Low; does not nest in the immediate vicinity, but transient and other non-breeding individuals could occasionally occur in the area.		
Burrowing owl Athene cunicularia	-	SSC	Nests and forages in grasslands, agricultural lands, open shrublands, and open woodlands with natural or artificial burrows or friable soils	Low; marginally suitable habitat is present adjacent to the borrow sites.		
Swainson's hawk Buteo swainsoni	-	ST	Nests in woodlands and scattered trees and forages in grasslands and agricultural fields	Known to occur; has nested at Ancil Hoffman Park, and suitable nest trees are available throughout the lower American River.		

## Table 3. Special-status Wildlife Evaluated for Potential to Occur on or Adjacent to the Restoration or Borrow Sites

	Stat	us	_	Potential to Occur on or Adjacent		
Species	Federal	State	Habitat Associations	Sites		
Western yellow-billed cuckoo Coccyzus americanus	FT		Riparian forest with dense deciduous trees and shrubs	Low; does not nest along the lower American River, but migrant individuals could occur in transit to breeding sites farther north.		
White-tailed kite Elanus leucurus	_	FP	Nests in woodlands and isolated trees and forages in grasslands, pasture, and agricultural fields	Known to occur; several nests have been documented in the study area.		
Bald eagle <i>Haliaeetus leucocephalus</i>	-	SE, FP	Coastal shorelines and wetlands, lakes, reservoirs, and rivers. Nests in large trees, typically in mountain and foothill forests and woodlands near reservoirs, lakes, and rivers	Moderate; not known to nest downstream of Lake Natoma, but the restoration sites provide suitable foraging habitat.		
Purple martin Progne subis	_	SSC	Deciduous woodland and coniferous forest; typically nests in old woodpecker cavities in tall, isolated tree or snag; also nests in human-made structures	Moderate; not known to nest along the lower American River, but bridges over the river and snags throughout the study area could provide suitable nest sites; could forage over project and borrow sites.		
Bank swallow <i>Riparia</i>	-	ST	Forages in a variety of habitats and nests in vertical banks or bluffs of suitable soil, typically adjacent to water	Known to occur; nest colonies have been documented upstream and downstream of Sunrise Boulevard; could nest at project and borrow sites if suitable habitat is present; could forage over restoration and borrow sites.		
Mammals						
Pallid bat Antrozous pallidus	_	SSC	Variety of habitats, including woodland, forest, grassland, and desert; roosts in tree cavities, rock crevices, mines, caves, and human structures.	Moderate; has not been documented recently in the project vicinity, but riparian forest and oak woodland at the restoration sites and nearby bridges could provide suitable roost sites; could forage over restoration and borrow sites.		
American badger Taxidea taxus	-	SSC	Arid, open grassland, shrubland, and woodland with soils suitable for burrowing.	Low; marginally suitable habitat is present adjacent to the borrow sites, but this species typically avoids urban and suburban environments.		

## Table 3. Special-status Wildlife Evaluated for Potential to Occur on or Adjacent to the Restoration or Borrow Sites

		Stat	us		Potential to Occur on or Adjacen					
	Species	Federal	State	Habitat Associations	to the Restoration or Borrow Sites					
<sup>1</sup> Status	Definitions									
- =	= No status									
Federal	<u>Status</u>									
FE =	Listed as Endangered	under the	Federal E	indangered Species Act						
FT =	Listed as Threatened	under the	Federal Er	ndangered Species Act						
State Sta	atus									
CE =	Candidate for Listing a	as Endang	ered unde	r the California Endangered	Species Act					
FP =	Fully Protected under	the Califor	nia Fish a	nd Game Code						
SE =	Listed as Endangered	under the	California	Endangered Species Act						
SSC =	California Species of S	Special Co	ncern							
ST =	Listed as Threatened	under the	California	Endangered Species Act						
Sources	: CDFW 2018; GEI data	2018; US	FWS 2018	Ba						

## Table 3. Special-status Wildlife Evaluated for Potential to Occur on or Adjacent to the Restoration or Borrow Sites

#### Special-status Fish

The following Federally and State-listed fish could occur at the restoration sites:

- California Central Valley steelhead (*Oncorhynchus mykiss*) distinct population segment (DPS) – Federally threatened
- Sacramento River winter-run Chinook salmon (O. tshawytscha) evolutionarily significant unit (ESU) – Federally and State endangered
- Central Valley spring-run Chinook salmon (O. tshawytscha) ESU Federally and State threatened

In addition to these threatened or endangered species, Central Valley fall-run Chinook salmon (*O. tshawytscha*), river lamprey (*Lampetra fluviatilis*), and hardhead (*Mylopharodon conocephalus*), all of which are California species of special concern, also could occur at the restoration sites. **Table 4** presents the temporal occurrence in the lower Sacramento River of special-status anadromous salmonids likely to occur at the restoration sites.

Despite modeling predictions indicating suitable habitat for Southern DPS of North American green sturgeon (*Acipenser medirostris*) occurs in the lower American River, no green sturgeon have been documented in the watershed (Mora et al. 2009, Beamesderfer et al. 2004). Considering the high level of recreational use and multi-year fishery monitoring efforts in the lower American River, the absence of any reported green sturgeon observations indicates an extremely low likelihood of green sturgeon presence on the restoration sites; therefore, this species is not addressed further in this document. In years of high flow, during early winter, Sacramento splittail (*Pogonichthys macrolepidotus*) may enter the American River and spawn in the lower reaches in areas of over-bank flooding, and various life stages of Sacramento splittail may inhabit the lower reaches of the river from December through May. However, because these spawning and rearing areas are well downstream of the restoration sites, this species also is not addressed further.

Recent steelhead monitoring data are scarce for the Lower American River system. The in-river population is small, with observations of a few hundred adult steelhead returning to spawn in the American River each year. During relatively recent observations (2003-2005, 2007), the presence of some spawning steelhead with adipose fins indicates that some in-river spawners are of wild origin (Hannon 2013). However, these wild origin fish are likely progeny of hatchery fish,

because the in-river population is likely entirely made up of Nimbus Fish Hatchery steelhead or their descendants (NMFS 2009). Juvenile rainbow/steelhead trout primarily use riffles and fast water habitats. As a result, there is a low likelihood that juvenile steelhead will be present in unrestored restoration sites before or during project activities.

Historically, there was no Sacramento River winter-run Chinook salmon ESU spawning population in the American River. However, small numbers of putative winter-run Chinook salmon juveniles have been captured in a rotary screw trap deployed at approximately RM 9, just downstream of the Watt Avenue Bridge (1995-1999, 2013, and 2014) (PSMFC 2014a,b; Snider and Payne 1998; Snider and Titus 2000, 2001). This indicates that some nonnatal rearing may occur in the lower American River. Most of these juveniles have been captured from January through March, with some captured as early as December and as late as April. Based on observed capture periods and warm temperatures during the summer months, nonnatal rearing is not anticipated to occur before November.

#### Table 4. Temporal Occurrence of Special-status Anadromous Salmonids in the Lower American River

Species	Month												
	Ja	n	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
California Centr	al Va	alley	y Steelł	nead					-				
Adult													
Immigration													
Adult													
Holding													
Spawning													
Egg													
Incubation													
Juvenile													
Rearing													
Juvenile													
Emigration													
Sacramento Riv	er W	/inte	er-run (	Chinook	Salmor	1							
Juvenile													
Nonnatal													
Rearing													
Juvenile													
Emigration													
Central Valley S	prin	g-ru	in Chin	ook Sal	mon								
Juvenile													
Nonnatal													
Rearing													
Juvenile													
Emigration													
Central Valley F	all-r	un (	Chinool	k Salmo	n	-	-	-					
Adult													
Immigration													
Adult													
Holding													
Spawning													

Egg Incubation							
Juvenile							
Rearing							
Juvenile							
Emigration							

Source: SAFCA 2001; PSMFC 2014a, b; Snider and Payne 1998; Snider and Titus 2000, 2001.

Historically, a Central Valley spring-run Chinook salmon spawning population occurred in the American River, but this population no longer exists due to their inability to access suitable spawning grounds upstream of Nimbus and Folsom dams. However, small numbers of putative spring-run Chinook salmon juveniles have been captured in the RM 9 rotary screw trap (1995-1999, 2013, and 2014) (PSMFC 2014a,b; Snider and Payne 1998; Snider and Titus 2000, 2001). This indicates that some nonnatal rearing may occur within the lower American River. Most of these juveniles have been captured from February through April, with some captured as early as December and as late as May. Based on observed capture periods and warm temperatures during the summer months, nonnatal rearing is not anticipated to occur before November.

Fall-run Chinook salmon spawning in the lower American River is induced by the release of cold water from Folsom Reservoir. Since 2000, 13,500–178,000 fall-run Chinook salmon have returned annually to the lower American River (Healey and Redding 2008). During this period, the hatchery took between 4,500–26,000 salmon; the remaining fish spawned in the river or died or were caught before spawning. Salmon that reach the hatchery diversion weir but do not enter the hatchery are thought to ultimately drop back downstream and spawn. When relatively large numbers of salmon return to spawn, there is insufficient spawning habitat available in the upper portions of the river. Placement of additional spawning gravel will help alleviate this limitation.

## Sensitive Habitats

Sensitive habitats include those that are of special concern to resource agencies or are afforded specific consideration through CEQA, ESA, Magnuson-Stevens Act, Section 1602 of the FGC, Section 404 of the CWA, and the Porter-Cologne Act. Sensitive habitats may be of special concern for a variety of reasons, including their locally or regionally declining status, or because they provide important habitat to special-status species.

## Critical Habitat and Essential Fish Habitat

Two areas of designated critical habitat for VELB are located on or adjacent to several of the restoration sites, between approximately RM 18 and RM19 and from RM 14.5 to RM 17 (USFWS 2019b). In addition, the American River from the confluence with the Sacramento River to Nimbus Dam is designated as critical habitat for Central Valley steelhead (USFWS 2019b) and Essential Fish Habitat (EFH) for Chinook salmon (NMFS 2018).

## Other Habitats Protected under Federal and State Regulations

Under Section 404 of the Federal CWA, the U.S. Army Corps of Engineers (USACE) regulates discharge of dredged or fill material into aquatic features that qualify as waters of the United States; wetlands that support hydrophytic vegetation, hydric soil types, and wetland hydrology may also qualify for USACE jurisdiction under Section 404 of the CWA. Under Section 401 of the CWA, the Central Valley Regional Water Quality Control Board (RWQCB) regulates discharge of dredged or fill material into waters of the United States that drain to the Central Valley, to ensure such activities do not violate State or Federal water quality standards; the Central Valley RWQCB also regulates waters of the State, in compliance with the Porter-Cologne

Act. In addition, all diversions, obstruction, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake in California that supports wildlife resources is subject to the regulatory approval of CDFW pursuant to Section 1602 of the FGC.

The American River is a navigable river from the confluence with the Sacramento River to Bradshaw Road (RM 12). Navigable rivers are subject to regulatory permitting under Section 10 of the Rivers and Harbors Act of 1899. Because all restoration sites are located upstream of RM 13, Section 10 of the Rivers and Harbors Act does not apply to the project.

The lower American River has a well-defined ordinary high-water mark (OHWM) that is readily identifiable by changes in vegetation, scour, water staining, and drift marks. The channel bottom is composed of gravels, cobbles, and unconsolidated sediments. Water depth fluctuates during summer months in this portion of the river, because it is downstream of Nimbus Dam and flows are subject to compliance with Central Valley Project Improvement Act. The lower American River at the restoration sites is a jurisdictional water of the United States subject to regulation under Sections 404 and 401 of the CWA and Section 1602 of the FGC.

Seasonal wetlands located above the plane of the OHWM of the river are known to occur at the borrow sites, notably in concave areas of dredge tailings (Water Forum 2008). These seasonal wetland features are characterized by hydrophytic vegetation, hydric soils, and positive indicators of hydrology, including surface water, saturated soils, and algal matting (Water Forum 2008). Seasonal wetland vegetation is variable along the lower American River, largely due to changes in soil substrate, micro watershed, and aspect, but it is dominated by hydrophytes, including tall flatsedge (*Cyperus eragrostis*), curly dock (*Rumex pulcher*), pale spikerush (*Eleocharis macrostachya*), and rushes (*Juncus* spp.). Seasonal wetland habitats on the borrow sites are subject to regulation under Sections 404 and 401 of the CWA and Section 1602 of the FGC.

#### Natural Communities of Special Concern

CDFW maintains a list of terrestrial natural communities that are native to California, the *Natural Communities* (CDFW 2018). Within that list, CDFW identifies and ranks natural communities of special concern considered to be highly imperiled. Valley oak woodland and riparian habitats, including those that occur on the restoration sites, are communities of special concern.

## Potential Impacts of the Proposed Action

Impacts of the proposed action on biological resources could result from removing gravel from the borrow sites, placing gravel in the American River, creating/enhancing floodplain and side channel habitat, and placing instream habitat structures. All in-channel activities would occur over a 4- to 6-week period in July–September. Although these activities would occur during the low-water season, in-water work could temporarily disturb aquatic biological resources and degrade water quality. Terrestrial impacts are anticipated to be relatively minor. Existing access points and routes to the borrow and restoration sites would be used. Vegetation removal may be required to create side-channels, but is anticipated to be very small (i.e., up to 20 trees at each site over the 16-year duration of the proposed action). It may be necessary to trim some trees along the access routes.

Potential for sensitive biological resources, including special-status species and regulated habitats, to be impacted by implementing the proposed action is evaluated below. This impact discussion focuses on resources with reasonable potential to occur on the restoration or borrow sites during project activities. Therefore, special-status plant and wildlife species that are unlikely to occur, because of a lack of suitable conditions, known extant range of the species, and/or lack of occurrence records, are not addressed in this discussion. Although nonnatal rearing winter-run and

spring-run Chinook salmon juveniles can occur seasonally at the restoration sites, they are not present during the construction work window and also are not addressed in this discussion.

#### **Special-status Species**

#### Plants

Sanford's arrowhead is the only special-status plant species with potential to occur in the study area. This plant has three occurrences mapped along the American River, including one occurrence in a concrete lined drainage channel, near the restoration site approximately 0.8 mile downstream of the Rossmoor Drive access point. The other nearby occurrences are along the river, within 3 miles of restoration sites. Ground disturbance at the restoration sites would primarily occur below the OHWM in areas where waters are generally fast moving and well oxygenated. Because Sanford's arrowhead occurs in slow moving waters, it is very unlikely to occur in areas of project-related disturbance, and unlikely to be adversely affected by project implementation. Therefore, this impact would be **less than significant**.

#### **Fisheries**

The proposed action includes a suite of habitat modification/restoration activities with the expressed intent to improve conditions for anadromous salmonids in the lower American River. Activities to augment spawning gravel, enhance floodplain and side channel habitats, and place instream habitat structures, are expected to improve habitat and increase spawning and rearing. Monitoring of past gravel placement indicates new spawning habitat for salmonids has been created. Therefore, impacts associated with changes in habitat conditions would be **beneficial**.

Operation of construction equipment in or adjacent to the river presents the risk of a spill of hazardous materials into the river (e.g., construction equipment leaking fluids). Additionally, onsite refueling of construction equipment can result in minor fuel and oil spills. Without rapid containment and clean up, these materials could have deleterious effects on special-status fish within the exposure area. Although juvenile salmonids are highly mobile and thus have the ability to avoid potentially hazardous materials, exposure to such materials could result in mortality of large numbers of special-status fishes and have a substantial adverse effect on local populations. Therefore, this potential impact from project-related increases in pollutant discharge on special-status fish would be **potentially significant**. Implementing Mitigation Measure 1 would reduce this impact to less than significant.

Project activities could result in short-term increases in suspended sediment and turbidity levels and impact fish populations through reduced food availability and feeding efficiency and exposure sediment released into the water column. At high levels, suspended solids can adversely affect the physiology and behavior of aquatic organisms and suppress photosynthetic activity at the base of food webs, affecting aquatic organisms either directly or indirectly (Alabaster and Lloyd 1980). Fish responses to increased turbidity and suspended sediment can range from behavioral changes (alarm reactions, abandonment of cover, and avoidance) to sublethal effects (e.g., reduced feeding rate), and, at high suspended sediment concentrations for prolonged periods, lethal effects (Newcombe and Jensen 1996). If this occurs while embryos are incubating, injury or mortality to incubating eggs or alevins can occur through the infiltration of fine sediment into salmonid redds with a reduction of intra-gravel water circulation and, in severe cases, entombment of salmonid eggs. Deposition of fine sediments in food-producing riffles also can reduce the abundance and availability of aquatic insects on which fish feed and result in loss of cover. Riffle supplementation and floodplain and side channel creation/enhancement require applying the gravel directly to the streambed and/or grading it, thereby disturbing silt and sand on the river bottom and increasing potential for adverse effects.

The amount of sediment that may be re-suspended by project activities is not anticipated to be substantial, and any re-suspension and re-deposition of instream sediments is expected to be localized and temporary. In addition, project activities would primarily occur within the middle of the active channel, where fewer juvenile salmonids are expected to be rearing. Previous studies indicate that juvenile salmonids tend to be found within 10-20 feet of river banks (Allen 2000, FISHBIO and Normandeau Associates 2012, Palmer and Hellmair 2012). Although some rearing and migrating juveniles may be found farther from the banks, the area disturbed by project activities and associated turbidity at any given time is expected to affect less than 40 percent of the river width and to be most concentrated within about 200 feet downstream of the restoration site. Therefore, juvenile salmonids will have opportunities to move to other portions of the channel where they can avoid potential impacts from turbidity increases. In addition, in-work work windows would prevent the siltation of steelhead redds and eggs. However, project-related increases in suspended sediment and turbidity have potential to cause adverse behavioral responses and sublethal and lethal effects, potentially resulting in a substantial adverse effect on local populations of juvenile salmonids and other special-status fish. Therefore, this impact would be potentially significant. Implementing Mitigation Measure 2 would reduce this impact to less than significant.

Gravel placement and grading activities for riffle supplementation, excavation activities for floodplain and side channel enhancement, and instream placement of habitat structures have potential to affect special-status fishes through displacement, disruption of normal behaviors, and direct injury or mortality. Rearing habitat for juvenile salmonids is generally well-distributed, allowing for juvenile movement to other areas to avoid the physical disturbance of construction activities. However, fish would not be able to use portions of the river where equipment is actively working or the associated turbidity plume occurs, and displacement may temporarily expose juvenile fish to a greater risk of predation. Although juvenile salmonids are generally expected to avoid areas where equipment is actively placing or excavating gravel, an undetermined number of these and other special-status fishes may attempt to find shelter in the substrate and could be injured or killed by equipment. Placing material in the active channel would generally occur along non-vegetated channel margins where juvenile salmonid presence is expected to be minimal due to the lack of vegetation cover. However, using heavy equipment in areas that are accessible by fish and/or installing temporary stream crossings could result in injury or mortality and have a substantial adverse effect on local populations. Therefore, this potential impact from direct injury or mortality of special-status fish would be potentially significant. Implementing Mitigation Measure 3 would reduce the impact to less than significant.

#### Invertebrates

Vernal pool fairy shrimp (*Branchinecta lynchi*) is known to occur within 3 miles of the restoration and borrow sites, including one occurrence near the Sailor Bar borrow site. This occurrence is from seasonal wetland habitat on the high floodplain terrace (CDFW 2019), outside the area of dredge tailings that would be used as borrow material. Vernal pool tadpole shrimp (*Lepidurus packardi*) has not been documented in this wetland, but it also could occur if habitat conditions are suitable. Based on review of aerial photography and past wetland delineation reports (Water Forum 2008, Reclamation 2015), up to 0.24 acre of seasonal wetland habitat is present on the Sailor Bar and Mississippi borrow sites combined. Seasonal wetlands in tailings on the borrow sites are less likely to be suitable for vernal pool fairy shrimp and vernal pool tadpole shrimp than wetlands on the high floodplain and are not expected to sustain ponded water long enough for either species to complete its lifecycle. However, potential for these species to occur on the borrow sites cannot be entirely excluded. Because project activities would remove material from dredge tailings, seasonal wetland habitat potentially occupied by vernal pool fairy shrimp and vernal pool tadpole shrimp and vernal pool tadpole shrimp than wetland habitat potentially occupied by vernal pool fairy shrimp and v

the local populations, depending on the amount of occupied habitat that is affected. Therefore, this potential impact from direct habitat modification would be **potentially significant**. Implementing Mitigation Measures 1, 2, and 6 (identified for impacts on State and Federally protected wetlands discussed below) would reduce this impact to less than significant.

Blue elderberry shrubs, the host plant for VELB larvae, are widely distributed throughout the restoration and borrow sites. There are a number of known occurrences of VELB on or near the sites, and two areas of designated critical habitat for VELB are located on or adjacent to the restoration sites. Project activities would not require removal or trimming of elderberry shrubs, but elderberry shrubs adjacent to the restoration and borrow sites could be indirectly affected. VELB typically emerge from elderberry shrubs in March to July. Because project activities would occur July–September, direct loss of individuals is unlikely to occur. However, indirect impacts on elderberry shrubs could affect habitat quality and larvae that may be present in the shrubs. Depending on the number of shrubs occupied by VELB that are affected, this could have a substantial adverse effect on the local VELB population. Therefore, this potential impact from indirect effects on elderberry shrubs would be **potentially significant**. Implementing Mitigation Measure 4 would reduce the impact to less than significant.

#### Reptiles

Western pond turtle (*Emys marmorata*) is known to occur along the lower American River and could be present on-site during project activities. Natural basking sites, such as partially submerged logs or rocks, vary in abundance along the lower American River, including at the restoration sites. However, habitat on the restoration and borrow sites is unlikely to be used for nesting, due to unsuitable substrate conditions. Placing gravel in the river could reduce habitat suitability for western pond turtle, but creating/enhancing floodplain and side channel habitat and placing in-stream woody material at restoration sites could improve habitat quality. If individual pond turtles are present on or adjacent to the restoration sites, they are likely to leave affected areas when project activities begin, and extensive areas of equally suitable habitat are present in immediately adjacent areas. Because project activities in a given year would be limited to a very small proportion of the overall project area and large river corridor, the number of individuals potentially affected would be low and is unlikely to substantially affect the local population. Therefore, this impact would be **less than significant**.

#### **Birds**

Eight special-status bird species—golden eagle (Aquila chrysaetos), bald eagle (Haliaeetus leucocephalus), western yellow-billed cuckoo (Coccyzus americanus), burrowing owl (Athene cunicularia), Swainson's hawk (Buteo swainsoni), white-tailed kite (Elanus leucurus), bank swallow (*Riparia riparia*), and purple martin (*Progne subis*)—have potential to occur on or adjacent to the restoration and/or borrow sites. Because project activities in a given year would be limited to a very small proportion of the overall project area and equally suitable habitat is relatively abundant in the project vicinity, any potential disruption of foraging activities would be very minor. Swainson's hawk, white-tailed kite, and bank swallow are known to nest on or near the restoration and borrow sites, but the sites generally support little vegetation cover and extensive areas of higher-quality forest and woodland nesting habitat is present along the lower American River. Project activities are anticipated to require limited and selective tree removal where side-channels are created. Tree removal and trimming, if necessary, would be very limited and would not substantially reduce the amount of nesting habitat. Suitable nesting habitat for burrowing owl and bank swallow may be present adjacent to restoration or borrow sites, but the sites themselves are unlikely to provide suitable burrow substrate for either species. However, if active nests of special-status birds are present on or near the restoration or borrow sites, they
could be disturbed by heavy equipment operation and construction personnel, potentially resulting in nest abandonment, reduced care of eggs or young, or premature fledging. Depending on the species and number of individuals that are affected, nest failure could have a substantial adverse effect on the local population. Therefore, this potential impact from failure of active nests of special-status birds would be **potentially significant**. Implementing Mitigation Measure 5 would reduce the impact to less than significant.

#### Mammals

Pallid bats (*Antrozous pallidus*) could forage over the restoration and borrow sites, but foraging activities are unlikely to be disturbed by construction activities. Forest and woodland habitat adjacent to the restoration and borrow sites and in bridges over the river may provide marginally suitable roost sites. However, these areas are not expected to support maternity roosts or other large numbers of roosting individuals, because pallid bats are very sensitive to disturbance of roost sites and may avoid existing disturbance from recreational use and adjacent residential areas. Because project activities would not remove roosting habitat, potential impacts are anticipated to be limited to disturbance of temporary roost sites for small numbers of individuals. This would not have a substantial adverse effect, if a population of pallid bats occurs at the restoration sites. Therefore, this impact would be **less than significant**.

American badger (*Taxidea taxus*) has low potential to occur in grassland and open woodland adjacent to the borrow sites. Although an individual was recently documented near Folsom dam (CDFW 2019), this species typically avoids heavily populated areas and is unlikely to occur regularly along the lower American River. Because project activities in a given year would be limited to a very small proportion of the overall study area, and badgers are unlikely to occur throughout most of the study area, the number of individuals potentially affected would be very low and is unlikely to substantially affect the local or regional population. Therefore, this impact would be **less than significant**.

#### Sensitive Habitats

The American River is a water of the United States subject to regulation under Sections 404 and 401 of the CWA and Section 1602 of the FGC. Implementing the proposed action would result in direct modification and placement of fill below the OHWM but would not result in the loss of channel capacity. However, project activities could temporarily degrade water quality in the river. Seasonal wetlands are known to occur at the borrow sites and could be directly modified if borrow material is removed from tailings that support wetlands. Degradation of river water quality and loss of seasonal wetlands that are considered sensitive aquatic sites could have a substantial adverse effect. Therefore, this potential impact on waters of the United States would be **potentially significant**. Implementing Mitigation Measures 1, 2, and 6 would reduce the impact to less than significant.

The proposed action is designed to improve conditions for anadromous salmonids in the lower American River, and monitoring has indicated that past gravel placement has created new spawning habitat for salmonids. Therefore, although project activities would temporarily disturb designated critical habitat for Central Valley steelhead and EFH for Chinook salmon, the overall result would be beneficial, and critical habitat would not be adversely affected. In addition, although project activities have potential to indirectly affect individual elderberry shrubs on or adjacent to the project and borrow sites, they would not result in substantial adverse effects to the two areas of designated critical habitat for VELB. Therefore, this impact would be **less than significant**.

### **Other Potential Impacts on Biological Resources**

### Movement Corridors and Nursery Sites

The restoration and borrow sites are part of a much larger contiguous extent of woodland and riparian habitats along the lower American River. The river system serves as a corridor and/or primary route for fish and wildlife migration movement. Project activities would not substantially interfere with the movement of native wildlife, because activities would be limited to a very small proportion of the overall project area and larger river corridor in a given year, would occur over a relatively brief period of time each year, and would not completely impede upstream or downstream wildlife movement. The in-water construction work window is timed specifically to avoid all periods of migration for anadromous salmonids. Therefore, potential impacts on fish and wildlife movement and migration would be **less than significant**.

The in-river construction work window would avoid the risk to spawning salmonid adults, incubating eggs, and pre-emergent fry. However, significant impacts on rearing juvenile salmonids and spawning and rearing of other native fish could occur (as described above under special-status fish). The lower American River serves as a nursery site for colonial-nesting bird species. In addition to potential for bank swallow and purple martin nest colonies in the project area (see above under special-status birds), three great blue heron (*Ardea herodias*) and great egret (*Ardea alba*) nest colonies are known to occur near the restoration /borrow sites. If nest colonies on or near the restoration or borrow sites are active during project implementation, they could be disturbed by heavy equipment operation and construction personnel, potentially resulting in nest abandonment, reduced care of eggs or young, or premature fledging. Because such colony sites are typically used for many years, nest failure and potential long-term colony abandonment could have a substantial adverse effect on the local nesting populations. Therefore, this potential impact on rearing juvenile salmonids, spawning and rearing of other native fish, and active heron/egret nest colonies would be **potentially significant**. Implementing Mitigation Measures 1, 2, 3, and 5 would reduce this impact to less than significant.

### Local Policies and Ordinances

The restoration and borrow sites are located within the area addressed by the *American River Parkway Plan* (Parkway Plan) (Sacramento County 2008). The Parkway Plan identifies policies and standards for projects within the plan area. The proposed action supports goals to preserve and protect anadromous and resident fishes and meets policies and standards defined in the Parkway Plan. Specifically, it is consistent with the Aquatic Communities Policy 3.7 to preserve, protect and/or restore riparian and in-channel habitat necessary for spawning and rearing of fish species. Sacramento County policies and ordinances (i.e., Sacramento County General Plan and the Sacramento County Tree Preservation and Protection Ordinance) protect native oak trees. The project may result in the selective removal of trees to create side-channels, but the removal of protected oaks is not anticipated. Therefore, the proposed action would have **no impact** related to potential conflict with local policies or ordinances protecting biological resources.

### Habitat Conservation Plans

The restoration and borrow sites are not within an area covered by an adopted Habitat Conservation Plan or Natural Community Conservation Plan. Actions and goals of the proposed action are consistent with those identified in the recovery plan for Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, and Central Valley steelhead (NMFS 2014). Additionally, the proposed action is designed to meet objectives of the Central Valley Project Improvement Act to mitigate effects of the Central Valley Project on native fishes. Therefore, the proposed action would have **no impact** related to potential conflict with any adopted conservation plan.

### **Mitigation Measures**

The following measures have been identified to reduce potential impacts on biological resources to less than significant.

### Mitigation Measure 1: Implement a Spill Prevention and Control Plan.

City/Water Forum shall implement the following measure to avoid and minimize adverse effects of project-related increases in pollutant discharge on special-status fish.

A written spill prevention and control plan (SPCP) shall be prepared and implemented. The SPCP and all material necessary for its implementation shall be accessible on-site prior to initiation of project construction and throughout the construction period. The SPCP shall include a plan for the emergency cleanup of any spills of fuel or other material. Employees/construction workers shall be provided the necessary information from the SPCP to prevent or reduce the discharge of pollutants from construction activities to waters and to use the appropriate measures should a spill occur. In the event of a spill, work shall stop immediately and NMFS, USFWS, and CDFW shall be notified within 24 hours.

**Significance after Mitigation:** With implementation of Mitigation Measure 1, the potentially significant impact associated with adverse effects of project-related increases in pollutant discharge on special-status fish would be reduced to a **less-than-significant** level, because the proposed action would avoid and minimize potential for and effects of accidental spill of hazardous materials into the river.

### Mitigation Measure 2: Implement a Stormwater Pollution Prevention Plan.

City/Water Forum shall implement the following measure to avoid and minimize adverse effects of project-related increases in suspended sediment and increased turbidity on special-status fish.

A Storm Water Pollution Prevention Plan (SWPPP) that identifies specific best management practices (BMPs) to avoid and minimize impacts on water quality during construction activities shall be prepared and implemented, as needed. BMPs may include:

• Erosion control measures that minimize soil or sediment from entering waterways and wetlands shall be installed, monitored for effectiveness, and maintained throughout construction activities.

**Significance after Mitigation:** With implementation of Mitigation Measure 2, the potentially significant impact associated with adverse effects of project-related increases in suspended sediment and turbidity on special-status fish would be reduced to a **less-than-significant** level, because the proposed action would avoid and minimize potential for increase in suspended sediments and turbidity.

# Mitigation Measure 3: Minimize Injury and Mortality of Special Status Fish Species

City/Water Forum shall implement the following measure to avoid and minimize direct injury and mortality of special-status fish.

 In-water work shall be restricted to July 1 through September 30, with consideration of the spatial and temporal distribution of spawning and incubating steelhead and fall-run Chinook salmon. Work past September 30 would be with approval from the National Marine Fisheries Service.

- Construction may be conducted year-round in areas, such as floodplains and side channels, when flowing water is absent due to separation from the main channel by gravel berms that are either naturally present or artificially created.
- In-water work in floodplains and side channels shall be limited to inlet/outlet areas during the last stage of reconnection to the main channel if working outside of the instream work timing window
- Instream habitat structures shall be placed when fish do not have access to the affected areas, as described above.
- Measures such as slow, deliberate equipment operation and tapping the water surface before entering the channel shall be implemented during in-water work to alert fish to equipment operation in the channel before gravel is placed.
- Before project activities begin, worker Environmental Awareness Training shall be
  provided to inform agency staff and contractors of the need to avoid and minimize
  potential impacts on special-status fish and the possible penalties for not complying with
  these requirements. The training shall include, at a minimum, species identification,
  habitat requirements and required practices for their avoidance and protection. A
  designated enforcement lead shall be identified to employees and contractors to ensure
  that questions regarding avoidance and protection measures are addressed in a timely
  manner.
- A designated enforcement lead shall monitor in-water construction activities to confirm proper implementation of conservation measures and water quality protection measures.

**Significance after Mitigation:** With implementation of Mitigation Measure 3, the potentially significant impact associated with project-related injury or mortality of special-status fish would be reduced to a **less-than-significant** level, because the proposed action would enforce restrictions related to in-water work, educate agency staff and contractors, and conduct biological monitoring.

# *Mitigation Measure 4: Minimize Effects to Valley Elderberry Longhorn Beetle.*

City/Water Forum shall implement the following measures to avoid and minimize potential adverse effects on valley elderberry longhorn beetle during project implementation.

- Before project activities begin, worker Environmental Awareness Training shall be
  provided to inform agency staff and contractors of the need to avoid and minimize
  potential impacts on VELB and its host plant and the possible penalties for not complying
  with these requirements. The training shall include, at a minimum, species identification,
  habitat requirements and required practices for their avoidance and protection. A
  designated enforcement lead shall be identified to employees and contractors to ensure
  that questions regarding avoidance and protection measures are addressed in a timely
  manner.
- All elderberry shrubs on or adjacent to work areas shall be temporarily fenced and designated as environmentally sensitive areas. These areas shall be avoided by all construction personnel. Fencing shall be placed at least 20 feet from the dripline of each shrub, unless otherwise approved by USFWS.
- Dirt roadways and disturbed areas within 100 feet of elderberry shrubs shall be watered at least twice a day to minimize dust emissions.

**Significance after Mitigation:** With implementation of Mitigation Measure 4, the potentially significant impact associated with adverse effects to VELB would be reduced to a **less-than-significant** level because the proposed action would educate agency staff and contractors and avoid and minimize potential disturbance of elderberry shrubs.

# *Mitigation Measure 5: Minimize Effects on Special-status and Other Nesting Birds*

City/Water Forum shall implement the following measures to avoid and minimize potential adverse effects on special-status and other nesting birds during project implementation.

- Before project activities begin, worker Environmental Awareness Training shall be provided to inform agency staff and contractors of the need to avoid and minimize potential impacts on nesting birds and the possible penalties for not complying with these requirements. The training shall include, at a minimum, species identification, habitat requirements and required practices for their avoidance and protection. A designated enforcement lead shall be identified to employees and contractors to ensure that questions regarding avoidance and protection measures are addressed in a timely manner.
- If vegetation removal is required during the bird nesting season (February 1 through August 15), surveys for active bird nests shall be conducted by a qualified biologist in areas of suitable nesting vegetation designated for removal. A minimum of one survey shall be conducted no more than 7 days before vegetation removal occurs. If active nests are found, removal of vegetation in which the nests are located shall be delayed until a qualified biologist determines that the young have fledged or the nest site is otherwise no longer in use.
- Preconstruction surveys for active nests of burrowing owl, Swainson's hawk, white-tailed kite, bank swallow, purple martin, and colonial nesting herons and egrets shall be conducted by a qualified biologist in all areas of suitable nesting habitat that could be disturbed by project activities. A minimum of two surveys shall be conducted within 14 days before project activities begin, including at least one survey no more than 7 days before activities begin.
- Appropriate buffers shall be established and maintained around active nest sites to avoid nest failure from project activities. The appropriate size and shape of the buffers shall be determined by a qualified biologist and may vary depending on the nest location, nest stage, construction activity, and existing disturbance levels. The buffers may be adjusted if a qualified biologist determines it would not be likely to adversely affect the nest. Monitoring shall be conducted to confirm that project activities are not resulting in detectable adverse effects on nesting birds or their young. No project activities shall occur within the buffer areas until a qualified biologist determines that the young have fledged or the nest site is otherwise no longer in use.

**Significance after Mitigation:** With implementation of Mitigation Measure 5, the potentially significant impact associated with failure of active nests of special-status birds and colonial-nesting herons/egrets would be reduced to a **less-than-significant** level because the proposed action would educate agency staff and contractors and implement buffers around active nests to minimize potential for nest failure.

# Mitigation Measure 6: Avoid and Minimize Impacts on Waters of the United States and Waters of the State.

City/Water Forum shall implement the following measures to avoid and minimize direct fill of waters of the United States and waters of the State in the Lower American River and minimize impacts on seasonal wetland habitats at the borrow sites.

- Ground disturbance shall be limited to gravel augmentation restoration sites and borrow sites. Existing access routes shall be used to obtain access to restoration and borrow sites. The total area of the project activity shall be limited to the minimum necessary. Borrow extraction areas and staging areas shall be placed to avoid and limit disturbance to the Lower American River and seasonal wetland habitats and shall provide a 250-foot setback from seasonal wetland habitats, to the extent feasible.
- Before the commencement of construction activities, high-visibility fencing shall be erected to protect areas of the Lower American River at gravel augmentation sites and identified seasonal wetland habitats at borrow sites that are located adjacent to disturbance areas but can be avoided from encroachment of personnel and equipment. The fencing shall be inspected before the start of each work day and shall be removed only when the construction within a given area is completed. Limits of waters of the United States and wetlands shall be incorporated into project bid specifications, along with a requirement for contractors to avoid these areas.
- A designated enforcement lead shall monitor all construction activities in waters of the United States to ensure that avoidance and minimization measures are being properly implemented and no unauthorized activities occur. The designated enforcement lead shall be empowered to stop construction activities that threaten to cause unanticipated and/or unauthorized significant adverse project impacts to allow resolution of these potential impacts by the City/Water Forum and U.S. Bureau of Reclamation. Project activity shall not resume until the conflict has been resolved.
- Authorization for direct fill of jurisdictional habitat in the American River and modification of seasonal wetlands at the borrow sites shall be obtained, as required, from USACE, Central Valley RWQCB, and CDFW.
  - **CWA Section 404:** Before any ground-disturbing project activities begin in areas containing wetlands or waters, a qualified biologist shall conduct a formal delineation of waters of the United States for CWA Section 404 permitting. The findings shall be documented in a detailed report <del>as</del> part of the formal Section 404 wetland delineation process.

Authorization for fill of jurisdictional waters of the United States shall be secured from USACE via the Section 404 permitting process before project construction. Any mitigation measures determined necessary during the 404 permitting process shall be implemented during project construction.

- **CWA Section 401:** Water quality certification pursuant to Section 401 of the CWA shall be obtained from the Central Valley RWQCB before starting project construction in any areas that may contain waters of the State. Any measures required as part of the issuance of water quality certification shall be implemented.
- **FGC Section 1602 or similar agreement:** A CDFW lake and streambed alteration agreement or similar approval from CDFW shall be obtained by the City for all activities that will substantially divert or obstruct the natural flow of water; substantially change or use any material from the bed, channel or bank of any river,

stream, or lake; or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake. Any conditions of issuance of the lake and streambed alteration agreement, including avoidance, minimization, and compensation measures, shall be implemented as part of project implementation.

**Significance after Mitigation:** With implementation of Mitigation Measure 6, the potentially significant impact associated with waters of the United States would be reduced to a **less-than-significant** level because direct and indirect impacts to would be avoided and minimized.

### Conclusions

Potential significant impacts on biological resources from implementing the proposed action can be reduced to less than significant by implementing appropriate mitigation measures identified in this report. Therefore, implementing the proposed action, including the proposed mitigation measures, would not result in any significant impacts to biological resources.

If you have any questions or concerns regarding this monitoring report, please contact me by phone at 916-912-4941 or e-mail at snorris@geiconsultants.com.

Sincerely,

Junal a. ms

Sarah A. Norris Senior Regulatory Specialist, Biologist

Due

Anne King Senior Wildlife Biologist

Attachment A: Figures 1-5 Attachment B: Special-status Species Query Results Attachment C: Photographs of Study Area

1804694

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## **Attachment A - Figures**

- Figure 1. Regional Location
- Figure 2. Topographic Map
- Figure 3. California Natural Diversity Database Plant Occurrences within 3 Miles of the Project and Borrow Sites
- Figure 4. California Natural Diversity Database Wildlife Occurrences and Designated Critical Habitat within 3 Miles of the Project and Borrow Sites

### Figure 1. Regional Location



Source: GEI Consultants, Inc. 2019

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### Figure 2. Topographic Map



Source: GEI Consultants, Inc. 2019





Figure 3. California Natural Diversity Database Plant Occurrences within 3 Miles of the Restoration and Borrow Sites

Source: GEI Consultants, Inc. 2019





Figure 4. California Natural Diversity Database Wildlife Occurrences and Designated Critical Habitat within 3 Miles of the Restoration and Borrow Sites

Source: GEI Consultants, Inc. 2019







### **California Natural Diversity Database**

**Query Criteria:** Quad<span style='color:Red'> IS </span>(Citrus Heights (3812163)<span style='color:Red'> OR </span>Carmichael (3812153)<span style='color:Red'> OR </span>Folsom (3812162)<span style='color:Red'> OR </span>Pleasant Grove (3812174)<span style='color:Red'> OR </span>Rio Linda (3812164)<span style='color:Red'> OR </span>Sacramento East (3812154)<span style='color:Red'> OR </span>Roseville (3812173)<span style='color:Red'> OR </span>Elk Grove (3812143)<span style='color:Red'> OR </span>Rocklin (3812172)<span style='color:Red'> OR </span>Clarksville (3812161)<span style='color:Red'> OR </span>Buffalo Creek (3812152))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Accipiter cooperii	ABNKC12040	None	None	G5	S4	WL
Cooper's hawk						
Agelaius tricolor	ABPBXB0020	None	Candidate	G2G3	S1S2	SSC
tricolored blackbird			Endangered			
Alkali Meadow	CTT45310CA	None	None	G3	S2.1	
Alkali Meadow						
Alkali Seep	CTT45320CA	None	None	G3	S2.1	
Alkali Seep						
Ammodramus savannarum	ABPBXA0020	None	None	G5	S3	SSC
grasshopper sparrow						
Andrena blennospermatis	IIHYM35030	None	None	G2	S2	
Blennosperma vernal pool andrenid bee						
Andrena subapasta	IIHYM35210	None	None	G1G2	S1S2	
An andrenid bee						
Antrozous pallidus	AMACC10010	None	None	G5	S3	SSC
pallid bat						
Aquila chrysaetos	ABNKC22010	None	None	G5	S3	FP
golden eagle						
Ardea alba	ABNGA04040	None	None	G5	S4	
great egret						
Ardea herodias	ABNGA04010	None	None	G5	S4	
great blue heron						
Athene cunicularia	ABNSB10010	None	None	G4	S3	SSC
burrowing owl						
Balsamorhiza macrolepis	PDAST11061	None	None	G2	S2	1B.2
big-scale balsamroot						
Branchinecta lynchi	ICBRA03030	Threatened	None	G3	S3	
vernal pool fairy shrimp						
Branchinecta mesovallensis	ICBRA03150	None	None	G2	S2S3	
midvalley fairy shrimp						
Buteo regalis	ABNKC19120	None	None	G4	S3S4	WL
ferruginous hawk						
Buteo swainsoni	ABNKC19070	None	Threatened	G5	S3	
Swainson's hawk						
<i>Ceanothus roderickii</i> Pine Hill ceanothus	PDRHA04190	Endangered	Rare	G1	S1	1B.1



## Selected Elements by Scientific Name California Department of Fish and Wildlife California Natural Diversity Database



Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Chlorogalum grandiflorum	PMLIL0G020	None	None	G3	S3	1B.2
Red Hills soaproot						
Chloropyron molle ssp. hispidum	PDSCR0J0D1	None	None	G2T1	S1	1B.1
hispid salty bird's-beak						
Clarkia biloba ssp. brandegeeae	PDONA05053	None	None	G4G5T4	S4	4.2
Brandegee's clarkia						
Coccyzus americanus occidentalis	ABNRB02022	Threatened	Endangered	G5T2T3	S1	
western yellow-billed cuckoo						
Crocanthemum suffrutescens	PDCIS020F0	None	None	G2?Q	S2?	3.2
Bisbee Peak rush-rose						
Desmocerus californicus dimorphus	IICOL48011	Threatened	None	G3T2	S2	
valley elderberry longhorn beetle						
Downingia pusilla	PDCAM060C0	None	None	GU	S2	2B.2
dwarf downingia						
Dumontia oregonensis	ICBRA23010	None	None	G1G3	S1	
hairy water flea						
Elanus leucurus	ABNKC06010	None	None	G5	S3S4	FP
	0770044004			00	00.4	
Elderberry Savanna	C1163440CA	None	None	G2	S2.1	
		Nono	Nono	C2C4	62	880
western pond turtle	ARAAD02030	none	NONE	6364	33	330
Frethizon dorsatum		None	None	<b>C</b> 5	63	
North American porcupine		None	None	05	00	
Falco columbarius	ABNKD06030	None	None	G5	S3S4	WI
merlin		Hono		00	0001	
Fremontodendron decumbens	PDSTE03030	Endangered	Rare	G1	S1	1B.2
Pine Hill flannelbush		0				
Fritillaria agrestis	PMLIL0V010	None	None	G3	S3	4.2
stinkbells						
Galium californicum ssp. sierrae	PDRUB0N0E7	Endangered	Rare	G5T1	S1	1B.2
El Dorado bedstraw						
Gratiola heterosepala	PDSCR0R060	None	Endangered	G2	S2	1B.2
Boggs Lake hedge-hyssop						
Great Valley Valley Oak Riparian Forest	CTT61430CA	None	None	G1	S1.1	
Great Valley Valley Oak Riparian Forest						
Haliaeetus leucocephalus	ABNKC10010	Delisted	Endangered	G5	S3	FP
bald eagle						
Hydrochara rickseckeri	IICOL5V010	None	None	G2?	S2?	
Ricksecker's water scavenger beetle						
Juncus leiospermus var. ahartii	PMJUN011L1	None	None	G2T1	S1	1B.2
Ahart's dwarf rush						



## Selected Elements by Scientific Name California Department of Fish and Wildlife California Natural Diversity Database



Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFV SSC or FP
Juncus leiospermus var. leiospermus	PMJUN011L2	None	None	G2T2	S2	1B.1
Red Bluff dwarf rush						
Lasionycteris noctivagans	AMACC02010	None	None	G5	S3S4	
silver-haired bat						
Laterallus jamaicensis coturniculus	ABNME03041	None	Threatened	G3G4T1	S1	FP
California black rail						
Legenere limosa	PDCAM0C010	None	None	G2	S2	1B.1
legenere						
Lepidurus packardi	ICBRA10010	Endangered	None	G4	S3S4	
vernal pool tadpole shrimp						
Linderiella occidentalis	ICBRA06010	None	None	G2G3	S2S3	
California linderiella						
Melospiza melodia	ABPBXA3010	None	None	G5	S3?	SSC
song sparrow ("Modesto" population)						
Navarretia myersii ssp. myersii	PDPLM0C0X1	None	None	G2T2	S2	1B.1
pincushion navarretia						
Northern Claypan Vernal Pool	CTT44120CA	None	None	G1	S1.1	
Northern Claypan Vernal Pool						
Northern Hardpan Vernal Pool	CTT44110CA	None	None	G3	S3.1	
Northern Hardpan Vernal Pool						
Northern Volcanic Mud Flow Vernal Pool	CTT44132CA	None	None	G1	S1.1	
Northern Volcanic Mud Flow Vernal Pool						
Oncorhynchus mykiss irideus pop. 11	AFCHA0209K	Threatened	None	G5T2Q	S2	
steelhead - Central Valley DPS						
Orcuttia tenuis	PMPOA4G050	Threatened	Endangered	G2	S2	1B.1
slender Orcutt grass						
Orcuttia viscida	PMPOA4G070	Endangered	Endangered	G1	S1	1B.1
Sacramento Orcutt grass						
Packera layneae	PDAST8H1V0	Threatened	Rare	G2	S2	1B.2
Layne's ragwort						
Pandion haliaetus	ABNKC01010	None	None	G5	S4	WL
osprey						
Phalacrocorax auritus	ABNFD01020	None	None	G5	S4	WL
double-crested cormorant						
Progne subis	ABPAU01010	None	None	G5	S3	SSC
Rana boylii	AAABH01050	None	Candidate Threatened	G3	S3	SSC
foothill yellow-legged frog						
Rana draytonii	AAABH01022	Ihreatened	None	G2G3	S2S3	SSC
			<b>-</b>	05	0.0	
Riparia riparia	ABPAU08010	None	Inreatened	G5	52	
Dalik Swallow						



## Selected Elements by Scientific Name California Department of Fish and Wildlife<sup>2</sup>

### California Natural Diversity Database



<b>O</b> ut of the	Element On th	Es dans l Otatura				Rare Plant Rank/CDFW	
Species	Element Code	Federal Status	State Status	Global Rank	State Rank	SSC or FP	
Sagittaria sanfordii	PMALI040Q0	None	None	G3	S3	1B.2	
Sanford's arrowhead							
Spea hammondii	AAABF02020	None	None	G3	S3	SSC	
western spadefoot							
Taxidea taxus	AMAJF04010	None	None	G5	S3	SSC	
American badger							
Thamnophis gigas	ARADB36150	Threatened	Threatened	G2	S2		
giant gartersnake							
Valley Needlegrass Grassland	CTT42110CA	None	None	G3	S3.1		
Valley Needlegrass Grassland							
Wyethia reticulata	PDAST9X0D0	None	None	G2	S2	1B.2	
El Dorado County mule ears							

**Record Count: 66** 

# IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

## Location



## Local office

Sacramento Fish And Wildlife Office

€ (916) 414-6600(916) 414-6713

Federal Building 2800 Cottage Way, Room W-2605 Sacramento, CA 95825-1846

# Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

- 1. Draw the project location and click CONTINUE.
- 2. Click DEFINE PROJECT.
- 3. Log in (if directed to do so).
- 4. Provide a name and description for your project.
- 5. Click REQUEST SPECIES LIST.

Listed species<sup>1</sup> and their critical habitats are managed by the <u>Ecological Services Program</u> of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries<sup>2</sup>).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact <u>NOAA Fisheries</u> for <u>species under their jurisdiction</u>.

- 1. Species listed under the <u>Endangered Species Act</u> are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the <u>listing status page</u> for more information.
- 2. <u>NOAA Fisheries</u>, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

## Reptiles NAMF STATUS Threatened Giant Garter Snake Thamnophis gigas No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4482 Amphibians NAME **STATUS** California Red-legged Frog Rana draytonii Threatened There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/2891 Threatened California Tiger Salamander Ambystoma californiense There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/2076 Fishes NAMF **STATUS** Threatened **Delta Smelt** Hypomesus transpacificus There is final critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/321 Insects NAME **STATUS** Valley Elderberry Longhorn Beetle Desmocerus californicus dimorphus Threatened There is **final** critical habitat for this species. Your location overlaps the critical habitat. https://ecos.fws.gov/ecp/species/7850

Crustaceans	
NAME	STATUS
Conservancy Fairy Shrimp Branchinecta conservatio There is final critical habitat for this species. Your location is outside the critical habitat. <u>https://ecos.fws.gov/ecp/species/8246</u>	Endangered
Vernal Pool Fairy Shrimp Branchinecta lynchi There is final critical habitat for this species. Your location is outside the critical habitat. <u>https://ecos.fws.gov/ecp/species/498</u>	Threatened
Vernal Pool Tadpole Shrimp Lepidurus packardi There is final critical habitat for this species. Your location is outside the critical habitat. <u>https://ecos.fws.gov/ecp/species/2246</u>	Endangered
Flowering Plants	STATUS
Sacramento Orcutt Grass Orcuttia viscida There is final critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/5507	Endangered
Slender Orcutt Grass Orcuttia tenuis There is final critical habitat for this species. Your location is outside the critical habitat. <u>https://ecos.fws.gov/ecp/species/1063</u>	Threatened
Critical habitats	
Potential effects to critical habitat(s) in this location must be analyzed along with the endang	gered species themselves.
This location overlaps the critical habitat for the following species:	
NAME	ТҮРЕ
Valley Elderberry Longhorn Beetle Desmocerus californicus dimorphus https://ecos.fws.gov/ecp/species/7850#crithab	Final

# Migratory birds

Certain birds are protected under the Migratory Bird Treaty  $Act^{1}$  and the Bald and Golden Eagle Protection  $Act^{2}$ .

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described <u>below</u>.

- 1. The <u>Migratory Birds Treaty Act</u> of 1918.
- 2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern <u>http://www.fws.gov/birds/management/managed-species/</u> <u>birds-of-conservation-concern.php</u>
- Measures for avoiding and minimizing impacts to birds <u>http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/</u>

conservation-measures.php

Nationwide conservation measures for birds
 <u>http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf</u>

The birds listed below are birds of particular concern either because they occur on the <u>USFWS Birds of Conservation Concern</u> (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ <u>below</u>. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the <u>E-bird data mapping tool</u> (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found <u>below</u>.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME

BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE

DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)

Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626

Burrowing Owl Athene cunicularia

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9737

California Thrasher Toxostoma redivivum

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Clark's Grebe Aechmophorus clarkii This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

**Common Yellowthroat** Geothlypis trichas sinuosa This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/2084

Golden Eagle Aquila chrysaetos This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680

Breeds Mar 15 to Aug 31

Breeds Jan 1 to Aug 31

Breeds Jan 1 to Jul 31

Breeds Jan 1 to Dec 31

Breeds May 20 to Jul 31

Breeds Jan 1 to Aug 31

Lawrence's Goldfinch Carduelis lawrencei This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <u>https://ecos.fws.gov/ecp/species/9464</u>	Breeds Mar 20 to Sep 20
Lewis's Woodpecker Melanerpes lewis This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <u>https://ecos.fws.gov/ecp/species/9408</u>	Breeds Apr 20 to Sep 30
Long-billed Curlew Numenius americanus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/5511	Breeds elsewhere
Nuttall's Woodpecker Picoides nuttallii This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA <u>https://ecos.fws.gov/ecp/species/9410</u>	Breeds Apr 1 to Jul 20
Oak Titmouse Baeolophus inornatus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <u>https://ecos.fws.gov/ecp/species/9656</u>	Breeds Mar 15 to Jul 15
Rufous Hummingbird selasphorus rufus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <u>https://ecos.fws.gov/ecp/species/8002</u>	Breeds elsewhere
Song Sparrow Melospiza melodia This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds Feb 20 to Sep 5

10

Spotted Towhee Pipilo maculatus clementae This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA <u>https://ecos.fws.gov/ecp/species/4243</u>

Tricolored Blackbird Agelaius tricolor

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

https://ecos.fws.gov/ecp/species/3910

Whimbrel Numenius phaeopus

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9483

Wrentit Chamaea fasciata

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Yellow-billed Magpie Pica nuttalli

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

https://ecos.fws.gov/ecp/species/9726

## Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

### Probability of Presence (

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

Breeds Apr 15 to Jul 20

Breeds Mar 15 to Aug 10

Breeds elsewhere

Breeds Apr 1 to Jul 31

Breeds Mar 15 to Aug 10

How is the probability of presence score calculated? The calculation is done in three steps:

- 1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
- 2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
- 3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

### Breeding Season (

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

### Survey Effort ()

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

### No Data (–)

A week is marked as having no data if there were no survey events for that week.

### Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

				~		-	probability of	presence	breedir	ng season	survey effe	ort       no da <sup>,</sup>	ta
SPECIES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
NU	) [												

Bald Eagle Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)	<b>₩</b> ₩₩₩	<b>₩</b> ₩₩₩	<b>++</b> + <b>+</b>	╂╋╋╂	┨╋╋	<b>┿</b> ╂╂╂	╫╫╫ <mark>┿</mark>	╂╂╂╂	++++	<b>•</b> +++	┼┿╪┿	****
Burrowing Owl BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)	***	***	++++	<b>₩</b> ₩₩₩	┼┼╪╪	+11+	∎┼≢┼	<b>#†#†</b>	++++++	<b>+</b> + <b>*</b> +	+++#	
California Thrasher BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)	++++	<del>       </del>	<u></u> + + + + + + + + + + + + +	<b>₩</b> ╂₩₩	<b>┿</b> ╇┿┼	<u>+++</u> +	++++	<b>+</b> + <b></b>	++++	++++	Ű,	1447
Clark's Grebe BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)	<b>₩</b> ₩₩	<u>++++</u>	<b>┿┿</b> ╂╂	╂╂╂╂	╂╂╂╂	<u></u> <u> </u> + + + + + + + + + + + + + + + + + +				YUN	<del>III</del> I	<del>   </del>
Common Yellowthroat BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)	++++	++ <b>+</b> +	<b>+</b> ++ <b>≠</b>	+#++	+++++++	$\mathbb{N}$	<u>m</u>	+ <b>)</b> +`	++##	₩₩₩	<b>┼┿</b> ┼┼	<b>#</b> + <b>#</b> +
Golden Eagle Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)	++++		"" R			<b>H</b> H	╂╂╂╂	<u>+</u> +++	++++	<b>+</b> ++ <b>+</b> ≢	++++	┼┿┼┼
Lawrence's Goldfinch BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)	<b>(</b> +++	<del> </del>	┿┼ <mark>┿</mark> ╂	╂╋╋╂	<del> </del> <u></u>  ++	<u></u> + + + + + + + + + + + + +	<del> </del>       	<del> </del>	<mark>╂╂╂</mark> ┼	++++	++++	++++

Lewis's Woodpecker BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)	<b>+</b> +++	<b>•</b> +++	++++	++ <mark>+</mark> ∔	1111	++++	++++	++++	++++	<b>*</b> *++	++++	++##
Long-billed Curlew BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)	++++	+++++	++++	++++	<b>₩</b> ++++	++++	++++	++++	++++	++++	++++	++++
Nuttall's Woodpecker BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)								1111		1111		3
Oak Titmouse BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)	1111		1111						 ~ \`		<b>W</b>	)IIII
Rufous Hummingbird BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)	++++	+++#	++++	++++	<b>₩</b> ₩++	++++	++++	5	1949	++++	++++	++++
SPECIES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Song Sparrow BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)	••••					Ŵ.	I					
Spotted Towhee BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)	 		5		1111		1111			1111		
Tricolored Blackbird BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)	++++	<b>+++</b> +	++++	<u></u> <u></u>         	****	ŧŧŧ	++++	<mark>┼┼</mark> ┼┼	<b>+</b> ++ <b>+</b>	<b>#</b> ++ <b>#</b>	<b>+</b> ++ <b>+</b>	<b>+</b> ++ <b>+</b>

Yellow-billed Magpie BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA	****			1111	1111	1111	1111	***	••••	1111		$\mathbb{Z}$
Wrentit BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)	++++	++++	++++	++++	++++	<del>  </del> +	++++	<mark>┼┼</mark> ┿┼	++++	<b>#</b> +++	+++++	<b>┼</b> ₩₩∔
Whimbrel BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)	++++	++++	++++	<b>₩</b> ₩+₩	++++	++++	++++	++++	++++	++++	++++	++++

#### Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

<u>Nationwide Conservation Measures</u> describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. <u>Additional measures</u> and/or <u>permits</u> may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

### What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS <u>Birds of Conservation Concern (BCC)</u> and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the <u>Avian Knowledge Network (AKN)</u>. The AKN data is based on a growing collection of <u>survey</u>, <u>banding</u>, <u>and citizen science datasets</u> and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (<u>Eagle Act</u> requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the <u>E-bird Explore Data Tool</u>.

### What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the <u>Avian Knowledge Network (AKN)</u>. This data is derived from a growing collection of <u>survey, banding, and citizen science datasets</u>.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

### How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: <u>The Cornell Lab of Ornithology All About Birds Bird Guide</u>, or (if you are unsuccessful in locating the bird of interest there), the <u>Cornell Lab of Ornithology Neotropical Birds guide</u>. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

### What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

- 1. "BCC Rangewide" birds are <u>Birds of Conservation Concern</u> (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
- 2. "BCC BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
- 3. "Non-BCC Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the <u>Eagle Act</u> requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

### Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the <u>Northeast Ocean Data Portal</u>. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the <u>NOAA NCCOS</u> <u>Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf</u> project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the <u>Diving Bird Study</u> and the <u>nanotag studies</u> or contact <u>Caleb Spiegel</u> or <u>Pam Loring</u>.

### What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

### Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

# Facilities

# National Wildlife Refuge lands

Any activity proposed on lands managed by the <u>National Wildlife Refuge</u> system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

## Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

# Wetlands in the National Wetlands Inventory

Impacts to <u>NWI wetlands</u> and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local <u>U.S. Army Corps of Engineers District</u>.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

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This location overlaps the following wetlands:

FRESHWATER EMERGENT WETLAND

PE	M1	Α
-		

- PEM1Ax
- PEM1Cx
- <u>PEM1C</u>
- PEM1Fx

FRESHWATER FORESTED/SHRUB WETLAND

FRESHWATER FORESTEDISTRU	JD WEILAND
<u>PSSA</u>	
<u>PSSCx</u>	
<u>PFOCx</u>	
<u>PFOA</u>	
<u>PFOC</u>	
<u>PFOAx</u>	
<u>PSSC</u>	
<u>PSSAx</u>	
FRESHWATER POND	
<u>PUBFx</u>	
<u>PUBHx</u>	
<u>PABFx</u>	
<u>PUBHh</u>	
<u>PUBKx</u>	
<u>PUBFh</u>	
PUSCh	
<u>PUSCx</u>	
<u>PUBF</u>	
LAKE	co
L1UBHh	
RIVERINE	
<u>KZUSA</u>	
R2USC R2UBHx R4SBC R4SBAx R5UBF R4SBA

A full description for each wetland code can be found at the National Wetlands Inventory website

#### **Data limitations**

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

#### Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

#### Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.



## **Plant List**

15 matches found. Click on scientific name for details

#### Search Criteria

Found in Quads 3812174, 3812173, 3812172, 3812164, 3812163, 3812162, 3812154 3812153 and 3812152;

<u>
 Modify Search Criteria</u>
 Search Criteria
 Search

Scientific Name	Common Name	Family	Lifeform	Blooming Period	CA Rare Plant Rank	State Listing Status	Federal Listing Status	Habitats	Lowest Elevatior	Highest Elevation	Photo
<u>Balsamorhiza</u> <u>macrolepis</u>	big-scale balsamroot	Asteraceae	perennial herb	Mar-Jun	1B.2			<ul> <li>Chaparral</li> <li>Cismontane woodland</li> <li>Valley and foothill grassland</li> </ul>	45 m	1555 m	1998 Dean Wm. Taylor
<u>Brodiaea rosea</u> <u>ssp. vallicola</u>	valley brodiaea	Themidaceae	perennial bulbiferous herb	Apr- May(Jun)	4.2			<ul> <li>Valley and foothill grassland (swales)</li> <li>Vernal pools</li> </ul>	10 m	335 m	no photo available
<u>Chloropyron</u> <u>molle ssp.</u> <u>hispidum</u>	hispid bird's- beak	Orobanchaceae	annual herb (hemiparasitic)	Jun-Sep	1B.1			<ul> <li>Meadows and seeps</li> <li>Playas</li> <li>Valley and foothill grassland</li> </ul>	1 m	155 m	2012 Doug Wirtz
<u>Clarkia biloba</u> <u>ssp.</u>	Brandegee's clarkia	Onagraceae	annual herb	May-Jul	4.2			<ul> <li>Chaparral</li> <li>Cismontane</li> <li>woodland</li> </ul>	75 m	915 m	-

• Lower montane coniferous forest



2008 Virginia Moran



2011 Dylan Neubauer



1998 John Game



2004 Carol W. Witham



<u>Downingia</u> pusilla	dwarf downingia	Campanulaceae	annual herb	Mar-May	2B.2	<ul> <li>Valley and foothill grassland (mesic)</li> <li>Vernal pools</li> </ul>	1 m	445 m
<u>Fritillaria</u> agrestis	stinkbells	Liliaceae	perennial bulbiferous herb	Mar-Jun	4.2	<ul> <li>Chaparral</li> <li>Cismontane woodland</li> <li>Pinyon and juniper woodland</li> <li>Valley and foothill grassland</li> </ul>	10 m	1555 m
<u>Gratiola</u> <u>heterosepala</u>	Boggs Lake hedge- hyssop	Plantaginaceae	annual herb	Apr-Aug	1B.2 CE	• Marshes and swamps (lake margins) • Vernal pools	10 m	2375 m
<u>Juncus</u> leiospermus var. ahartii	Ahart's dwarf rush	Juncaceae	annual herb	Mar-May	1B.2	• Valley and foothill grassland (mesic)	30 m	229 m

<u>Juncus</u> leiospermus var. leiospermus	Red Bluff dwarf rush	Juncaceae	annual herb	Mar-Jun	1B.1			<ul> <li>Chaparral</li> <li>Cismontane woodland</li> <li>Meadows and seeps</li> <li>Valley and foothill grassland</li> <li>Vernal pools</li> </ul>	35 m	1250 m	light Dean Wm. Taylor
<u>Legenere</u> <u>limosa</u>	legenere	Campanulaceae	annual herb	Apr-Jun	1B.1			• Vernal pools	1 m	880 m	1993 Dean Wm. Taylor
<u>Navarretia</u> <u>myersii ssp.</u> mversii	pincushion navarretia	Polemoniaceae	annual herb	Apr-May	1B.1			• Vernal pools	20 m	330 m	no photo available
<u>Navarretia</u> nigelliformis ssp. nigelliformis	adobe navarretia	Polemoniaceae	annual herb	Apr-Jun	4.2			• Valley and foothill grassland vernally mesic • Vernal pools sometimes	100 m	1000 m	2008 Steve Matson
<u>Orcuttia tenuis</u>	slender Orcutt grass	Poaceae	annual herb	May- Sep(Oct)	1B.1	CE	FT	• Vernal pools	35 m	1760 m	



1991 Dean Wm. Taylor

<u>Orcuttia viscida</u>	Sacramento Orcutt grass	Poaceae	annual herb	Apr- Jul(Sep)	1B.1	CE	FE	• Vernal pools	30 m	100 m	2004 Carol W. Witham
<u>Sagittaria</u> sanfordii	Sanford's arrowhead	Alismataceae	perennial rhizomatous herb (emergent)	May- Oct(Nov)	1B.2			• Marshes and swamps (assorted shallow freshwater)	0 m	650 m	

2007 Wendy Fisher

#### **Suggested Citation**

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The California Lichen Society California Natural Diversity Database The Jepson Flora Project The Consortium of California Herbaria CalPhotos Questions and Comments rareplants@cnps.org

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Quad Name Carmichael
Quad Number 38121-E3

#### **ESA Anadromous Fish**

SONCC Coho ESU (T) -CCC Coho ESU (E) -CC Chinook Salmon ESU (T) -CVSR Chinook Salmon ESU (T) -SRWR Chinook Salmon ESU (E) -NC Steelhead DPS (T) -CCC Steelhead DPS (T) -SCCC Steelhead DPS (T) -SC Steelhead DPS (E) -CCV Steelhead DPS (E) -CCV Steelhead DPS (T) -Eulachon (T) -SDPS Green Sturgeon (T) -

## ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -CCC Coho Critical Habitat -CC Chinook Salmon Critical Habitat -CVSR Chinook Salmon Critical Habitat -SRWR Chinook Salmon Critical Habitat -NC Steelhead Critical Habitat -CCC Steelhead Critical Habitat -SCCC Steelhead Critical Habitat -SC Steelhead Critical Habitat -CCV Steelhead Critical Habitat -Eulachon Critical Habitat -

#### **ESA Marine Invertebrates**

Range Black Abalone (E) -Range White Abalone (E) -

#### ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

#### **ESA Sea Turtles**

East Pacific Green Sea Turtle (T) -Olive Ridley Sea Turtle (T/E) -Leatherback Sea Turtle (E) -North Pacific Loggerhead Sea Turtle (E) -

## ESA Whales

Blue Whale (E) -Fin Whale (E) -Humpback Whale (E) -Southern Resident Killer Whale (E) -North Pacific Right Whale (E) -Sei Whale (E) -Sperm Whale (E) -

#### ESA Pinnipeds

Guadalupe Fur Seal (T) -Steller Sea Lion Critical Habitat -

#### **Essential Fish Habitat**

Coho EFH -Chinook Salmon EFH -Groundfish EFH -Coastal Pelagics EFH -Highly Migratory Species EFH -

#### MMPA Species (See list at left)

#### ESA and MMPA Cetaceans/Pinnipeds See list at left and consult the NMFS Long Beach office 562-980-4000

MMPA Cetaceans - MMPA Pinnipeds - Quad NameCitrus HeightsQuad Number38121-F3

#### **ESA Anadromous Fish**

SONCC Coho ESU (T) -CCC Coho ESU (E) -CC Chinook Salmon ESU (T) -CVSR Chinook Salmon ESU (T) -SRWR Chinook Salmon ESU (E) -NC Steelhead DPS (T) -CCC Steelhead DPS (T) -SCCC Steelhead DPS (T) -SC Steelhead DPS (E) -CCV Steelhead DPS (T) -Eulachon (T) -SDPS Green Sturgeon (T) -

## ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -CCC Coho Critical Habitat -CC Chinook Salmon Critical Habitat -CVSR Chinook Salmon Critical Habitat -SRWR Chinook Salmon Critical Habitat -NC Steelhead Critical Habitat -CCC Steelhead Critical Habitat -SCCC Steelhead Critical Habitat -SC Steelhead Critical Habitat -CCV Steelhead Critical Habitat -Eulachon Critical Habitat -

#### ESA Marine Invertebrates

Range Black Abalone (E) -Range White Abalone (E) -

#### **ESA Marine Invertebrates Critical Habitat**

Black Abalone Critical Habitat -

#### **ESA Sea Turtles**

East Pacific Green Sea Turtle (T) -Olive Ridley Sea Turtle (T/E) -Leatherback Sea Turtle (E) -North Pacific Loggerhead Sea Turtle (E) -

## ESA Whales

Blue Whale (E) -Fin Whale (E) -Humpback Whale (E) -Southern Resident Killer Whale (E) -North Pacific Right Whale (E) -Sei Whale (E) -Sperm Whale (E) -

#### ESA Pinnipeds

Guadalupe Fur Seal (T) -Steller Sea Lion Critical Habitat -

#### **Essential Fish Habitat**

Coho EFH -Chinook Salmon EFH -Groundfish EFH -Coastal Pelagics EFH -Highly Migratory Species EFH -

#### MMPA Species (See list at left)

#### ESA and MMPA Cetaceans/Pinnipeds See list at left and consult the NMFS Long Beach office 562-980-4000

MMPA Cetaceans - MMPA Pinnipeds - Quad NameFolsomQuad Number38121-F2

#### **ESA Anadromous Fish**

SONCC Coho ESU (T) -CCC Coho ESU (E) -CC Chinook Salmon ESU (T) -CVSR Chinook Salmon ESU (T) -SRWR Chinook Salmon ESU (E) -NC Steelhead DPS (T) -CCC Steelhead DPS (T) -SCCC Steelhead DPS (T) -SC Steelhead DPS (E) -CCV Steelhead DPS (T) -Eulachon (T) -SDPS Green Sturgeon (T) -

#### **ESA Anadromous Fish Critical Habitat**

SONCC Coho Critical Habitat -CCC Coho Critical Habitat -CC Chinook Salmon Critical Habitat -CVSR Chinook Salmon Critical Habitat -SRWR Chinook Salmon Critical Habitat -NC Steelhead Critical Habitat -CCC Steelhead Critical Habitat -SCCC Steelhead Critical Habitat -SC Steelhead Critical Habitat -CCV Steelhead Critical Habitat -Eulachon Critical Habitat -

#### **ESA Marine Invertebrates**

Range Black Abalone (E) -Range White Abalone (E) -

#### ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

#### **ESA Sea Turtles**

East Pacific Green Sea Turtle (T) -Olive Ridley Sea Turtle (T/E) -Leatherback Sea Turtle (E) -North Pacific Loggerhead Sea Turtle (E) -

## ESA Whales

Blue Whale (E) -Fin Whale (E) -Humpback Whale (E) -Southern Resident Killer Whale (E) -North Pacific Right Whale (E) -Sei Whale (E) -Sperm Whale (E) -

#### ESA Pinnipeds

Guadalupe Fur Seal (T) -Steller Sea Lion Critical Habitat -

#### **Essential Fish Habitat**

Coho EFH -Chinook Salmon EFH -Groundfish EFH -Coastal Pelagics EFH -Highly Migratory Species EFH -

#### MMPA Species (See list at left)

#### ESA and MMPA Cetaceans/Pinnipeds See list at left and consult the NMFS Long Beach office 562-980-4000

MMPA Cetaceans - MMPA Pinnipeds -



View of furthest downstream restoration site located near William B. Pond Park near RM 14.



View of restoration site located at RM 16.5.



# LOWER AMERICAN RIVER SALMONID HABITAT IMPROVEMENT PROJECT

UPPER SAILOR BAR, RIVER MILE 22.50 UNITED STATES BUREAU OF RECLAMATION, UNITED STATES FISH AND WILDLIFE SERVICE AND THE WATER FORUM IN COOPERATION WITH CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE



## CONTACTS

TOM GOHRING, EXECUTIVE DIRECTOR JOHN HANNON, FISHERIES BIOLOGIST CHRIS HAMMERSMARK, DIRECTOR

(916) 668-5236

CONTOURS AND ELEVATIONS SHOWN ON PLANS PROVIDED BY SITE SURVEY TIED INTO CONTROL POINT DH6482 LOCATED AT LAT:38°35'23.61", LONG:121°17'18.8" WITH A PUBLISHED ELEVATION OF 99.7 FT (NAVD88, GEOID 12A). OUTLYING TOPOGRAPHY IS REFERENCED TO THE 2017 WATER FORUM AND SAFCA LIDAR



INDICATES SECTION LABEL

**INDICATES SHEET NUMBER** IN WHICH SECTION APPEARS

PROFILES C4

SECTIONS C5 C6 STAKING PLAN













AMATION naging Water in the West

SIDE CHANNEL BYPASS PROFILE



LOCATION: D:\Projects\18-1007\_2018\_LAR\_GA\_Upper\_Sailor\_Bar\400\_Technical\_Data\403\_CAD\_Data\\_DWGS\Production\Sections.dwg















