



UNITED STATES DEPARTMENT OF COMMERCE
 National Oceanic and Atmospheric Administration
 NATIONAL MARINE FISHERIES SERVICE
 West Coast Region
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June 16, 2017

Refer to NMFS No: WCR-2016-5506

Mr. David Murillo
 Regional Director – Mid-Pacific Region
 U.S. Bureau of Reclamation
 2800 Cottage Way, MP-3700
 Sacramento, California 95825-1898

Mr. William Croyle
 Acting Director
 California Department of Water Resources
 1416 Ninth Street
 Sacramento, California 95814

Re: Endangered Species Act Section 7(a)(2) Biological Opinion, Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response, and Fish and Wildlife Coordination Act Recommendations for the California WaterFix Project in Central Valley, California

Dear Mr. Murillo and Mr. Croyle:

Thank you for your letter, received August 2, 2016, requesting initiation of consultation with NOAA's National Marine Fisheries Service (NMFS) pursuant to section 7 of the Endangered Species Act of 1973 (ESA) (16 U.S.C. 1531 *et seq.*) for the proposed California WaterFix Project (Project).

Based on the best available scientific and commercial information, the Biological Opinion (Opinion) concludes that the Project is not likely to jeopardize the continued existence of federally listed:

- Endangered Sacramento River winter-run Chinook salmon (*Oncorhynchus tshawytscha*),
- Threatened Central Valley spring-run Chinook salmon (*O. tshawytscha*),
- Threatened Central Valley steelhead (*O. mykiss*),
- Threatened Southern Distinct Population Segment (DPS) of North American green sturgeon (*Acipenser medirostris*), and
- Endangered Southern Resident killer whales (*Orcinus orca*).

NMFS concludes that the Project is not likely to destroy or adversely modify the designated critical habitats of:

- Sacramento River winter-run Chinook salmon,
- Central Valley spring-run Chinook salmon,
- Central Valley steelhead, and
- Southern DPS of North American green sturgeon.



noise. The effects are expected to range from behavioral modifications and increased stress responses, to injury and mortality dependent on the proximity and duration of the exposure.

2.5.1.1.1.4.3 Green Sturgeon Exposure and Risk

Detailed timing and spatial occurrence of sDPS green sturgeon presence has previously been described in Section 2.4 Environmental Baseline. As discussed in those sections, juvenile and sub-adult sDPS green sturgeon may be present during any month of the year throughout the waters of the Delta, whereas adult green sturgeon are less widespread, primarily occurring in the waters of the north Delta along the principal migratory pathway between the ocean and upstream spawning habitats in the Sacramento River from late winter and early spring months into the late summer and early fall months each year. As the locations for the proposed barge landings are spread widely across the Delta, the potential for exposure of juvenile, sub-adult, and adult sDPS green sturgeon to the pile-driving-induced acoustic effects associated with their construction is tempered only by the July 1 through August 31 in-water construction period established for that effort. NMFS therefore expects that the acoustics effects of pile driving at the barge landing locations will adversely affect a small proportion of juvenile, sub-adult, and adult green sturgeon.

2.5.1.1.1.2 Barge Traffic

According to the PA description in the BA, contractors are expected to use barges to deliver tunnel boring machine (TBM) components to TBM launch sites. Barges may also be used to transport other heavy or bulky equipment or materials to or from those sites. Barge landings will therefore be constructed at each TBM launch shaft site for loading and unloading construction equipment, materials, fill, and tunnel spoils. A total of seven barge landings are currently proposed in the PA (BA Appendix 3.A Map Book for the Proposed Action) at the following locations:

- Adjacent to Proposed Intermediate Forebay (on Snodgrass Slough north of Twin Cities Road)
- South Bouldin Island (on Little Potato Slough)
- South Venice Island (on San Joaquin River)
- East Mandeville Island (on San Joaquin River at junction with Middle River)
- North Bacon Island (on Middle River)
- Northwest Victoria Island (on Old River)
- Clifton Court Forebay (Old River at junction with West Canal)

In addition to the seven barge landing locations described above, Reclamation and its partners have indicated that an additional barge landing location was identified by the applicant during consultation and may be built at the contractor's discretion on the Sacramento River at NDD Intake 2.

Based on information provided by the applicant, the two main destinations are the barge landings at CCF and Bouldin Island.

Barge operations associated with these landings are described as follows:

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- From June 1 through October 31, barge traffic may travel from all three origins (Stockton, San Francisco, and Antioch).
- From November 1 through February 28, barge traffic will be limited to travel from Port of Stockton to Bouldin Island.
- From March 1 through May 31, barge traffic will be restricted to move only critical heavy construction equipment in the San Joaquin River.
- Barges will be commercial vessels propelled by tugboats. Barge sizes have not been finalized, but are expected to be approximately 200- to 250-feet-long and 50-feet-wide with a draft of 6 to 12 feet. Commercial barge operators on the Sacramento River are required to operate in compliance with navigational guidelines.
- Barges will be required to use existing landings where possible and maintain a minimum waterway width greater than 100 feet (assuming maximum barge width of 50 feet).
- Barge operations will occur only during the work week and will not occur on weekends.
- Barges and tugs will travel at 5 knots loaded and 8 knots empty through Delta waterways and San Francisco Bay estuary.
- Each landing will be in use during the entire construction period at each location (5 to 6 years). All landings will be removed at the end of the PA construction period.
- Barges are expected to be used for delivery of TBM components and may also be used for transport of precast tunnel segment liner sections, reusable tunnel material (RTM), crushed rock and aggregate, etc.; pile-driving rigs and barge-mounted cranes; suction dredging equipment; post-construction underwater debris removal; and other activities.
- According to information provided in the PA, approximately 5,530 barge trips are projected to carry tunnel segment liners from ports in San Francisco, Antioch, and Stockton to two primary landings of CCF and Bouldin Island via the Sacramento and San Joaquin rivers and adjacent waterways. This averages to approximately four one-way trips per day for up to 5.5 years to each of the two landing locations during the June 1 to October 31 work window, with an equal distribution from the ports of origin (i.e., one third of the trips originate, respectively, from the Port of Stockton, Port of Antioch, and San Francisco). During the November 1 to February 28 period, up to four trips per day will be made from the Port of Stockton to Bouldin Island landing. From March 1 to May 31, only those trips deemed absolutely necessary to transport critical materials to Bouldin Island will be made from the Port of Stockton. During the period from November 1 to May 31, no trips will originate from the ports in San Francisco or Antioch. The assumed number of trips to CCF is 729 (one-way) and to Bouldin Island is 1115 (one-way). This information is shown in Table 2-33.
- Because barges may also be used for transport of bulk materials to the other landings as described above, a total of 9,400 one-way barge trips are projected as a conservative assumption (i.e., a greater number of trips is not expected to occur) for transport of all materials required by the PA. Number of trips and anticipated extent of use for secondary locations are shown in Table 2-34.

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- To protect aquatic habitat and listed fish species, the barge operations plan (AMM7) will require barges and towing vessels to comply with standard navigation and operating rules to avoid or minimize physical disturbances and water quality impacts in the navigable waterways of the Delta. Where avoidance is not possible, the plan will include provisions to minimize effects as described in the BA in Appendix 3.F General Avoidance and Minimization Measures, Section 3.F.2.7.4 Environmental Training and Section 3.F.2.7.5 Dock Approach and Departure Protocol.

Table 2-33. Barge Route and Operation Assumptions Provided by DWR for the Three Anticipated Barge Origin Locations and Two Primary Landing Locations.

Barge Origin	Barge Landing Location	Estimated One-Way Distance (miles)	Number of Trips for Route (Assume 1/3 of trips from each Origin)
San Francisco	Bouldin Island	75.0	1115
Stockton	Bouldin Island	18.5	1115
Kie-Con (Antioch)	Bouldin Island	14.2	1115
San Francisco	Clifton Court	93.6	729
Stockton	Clifton Court	37.1	729
Kie-Con (Antioch)	Clifton Court	32.8	729

Table 2-34. Barge Operation and Use Assumptions Provided by DWR for the Secondary Landing Locations.

Barge Landing Location	Number of One-Way Trips to Landing	Assumptions for Use
Intermediate Forebay	435	This site is near major highway so most if not all segment, fill, material, and equipment deliveries will be trucked in. Dock would be of limited use. One trip every five days.
Venice Island	500	No road access. This site may be used for 6 months of geotechnical investigations and 12 months' construction of potential emergency access shaft and safe haven; 100 barge trips total for equipment deliveries; 400 to build emergency access and safe havens.
Mandeville Island	400	No road access. This site may be used for 12 months of geotechnical investigations and 18 months' construction of potential emergency access shaft and safe haven; 300 trips to build emergency construction access and safe haven; 100 barge trips total for equipment deliveries.
Bacon Island	2150	Road access is available. Unloading facility will be used for months for geotech investigations, 12 months to build retrieval pad, 24 months to build retrieval shaft and safe havens; 1400 barge trips for construction of retrieval pad; 200 trips for equipment deliveries and TMB removal; 600 trips for emergency construction access and safe haven.
Victoria Island	375	Road access is available. Unloading facility will be used for 24 months to build retrieval shafts and safe havens; 300 trips for construction of emergency access and safe havens; 75 barge trips total for equipment deliveries.

NMFS used the above information provided by the applicant to develop assumptions related to barge traffic in determining effects to listed species.

Because water depth in the Old River corridor to CCF is limited to 10 feet (i.e., the controlling depth at mean lower low water), vessels should not have a deeper draft than 10 feet (with a clearance of 2 feet from the bottom). The assumed length of tug boats is 65 to 100 feet with a beam of approximately 35 feet and a draft of approximately 6 to 8 feet. NMFS assumes that propeller disc diameter is approximately 70 percent of the draft, thus propeller discs will be approximately 50 to 70 in. in diameter, which corresponds to the dimensions for typical tugs operating in the Delta and San Francisco Bay. Tugs in the San Francisco Bay and Delta typically use shrouded propellers (e.g., Kort nozzles) that direct the thrust of the propeller jet in a confined cone providing more maneuverability, but potentially a more confined and longer lasting jet of propeller wash.

Based on an assumed velocity of 5 to 8 knots, a barge trip from the San Francisco port to the furthest landing location at CCF and back (187 miles round trip) can take upwards of 24 hours. NMFS therefore assumes that there is potential for barge operations to occur throughout a 24-hour period each day of the work week.

Based on the information provided by the applicant NMFS assumes that approximately 5,530 one-way trips will originate from one of the three origin locations and terminate at one of the two main barge landing locations at Bouldin Island or CCF throughout the construction phase

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of the PA. The assumed number of one-way trips to CCF is 2,185 and to Bouldin Island is 3,344. It is assumed that there will be four trips to each of these barge landings per day and four returning trips back to the port of origin for a total of 16 trips per day combined for both sites during the June 1 through October 31 period. From November 1 through February 28, barge trips will only go between the Port of Stockton and Bouldin Island, with the expectation that there will be 4 round trips per day (8 one way trips total). From March 1 through May 31, trips will be less frequent and limited to those deemed absolutely necessary to move critical equipment and materials that cannot be moved by land. Based on the estimated barge traffic information provided by the applicant, this results in 1,672 days of barge travel to Bouldin Island and 1,093 days of barge travel to CCFB.

During the 5 to 6 years of constructing the tunneled conveyance and other facilities, it is projected that up to 9,400 barge trips may be added to the daily vessel traffic in the action area. This is estimated based on an anticipated additional 3,900 one-way trips to the secondary locations show in Table 2-34. These trips will occur during the June 1 through October 31 period spread over the time of constructing the tunneled conveyance and other facilities. Assuming that the 3,900 one-way trips and the required return trips (for a total of 7,800 one-way trips) are distributed over the five landing locations throughout a 5-year period, the increase in traffic to four of these landings results in approximately one trip per day per landing. Only Bacon Island will require four trips per day during the June 1 through October 31 time period to meet its projected total of 2,150 one-way trips in the 5-year construction period.

Vessels originating from San Francisco will have to transit the middle and north San Francisco Bay regions, San Pablo Bay, the Carquinez Strait, Suisun Bay, and then either follow the Sacramento or Stockton deep water ship channels (DWSC) to their terminal barge landing locations. Sites located adjacent to the NDD locations will have to follow the Sacramento River channel upstream of Rio Vista. Barge landing sites located at Snodgrass Slough, Venice Island, or Bouldin Island will require barges and tugs to move through the Stockton DWSC from Antioch to approximately Webb Point on the San Joaquin River (RM 22). Barges destined for Snodgrass Slough will have to navigate upriver through the Mokelumne River system (likely the North Fork of the Mokelumne River). Barges destined for Bouldin Island will enter Potato Slough from the San Joaquin River at RM 22. Barges destined for the Venice Island location will continue up the Stockton DWSC to Prisoners Point (RM 25) and then move into the Venice Reach. Barge traffic destined for either Mandeville Island or Bacon Island will move upriver in the Stockton DWSC to Middle River, then move southwards in Middle River to the barge landing locations. Barge traffic destined for either Victoria Island or the CCF locations will move through the Stockton DWSC to Old River, and then move southwards in Old River to those barge landing locations.

Vessels originating from the Port of Antioch will transit either the Sacramento DWSC or the Stockton DWSC. Routes are essentially the same as those barges originating from San Francisco, except that barge traffic destined for NDD locations may either go upstream in the Stockton DWSC and access the Sacramento DWSC via Threemile Slough (RM 15) or go back downstream and enter the Sacramento DWSC via Broad Slough.

Vessels originating from the Port of Stockton will use the Stockton DWSC to access the different barge landing sites at the previously mentioned navigation points.