



State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
North Central Region
1701 Nimbus Road, Suite A
Rancho Cordova, CA 95670-4599
916-358-2900
www.wildlife.ca.gov

GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director



July 30, 2024

Kristin Ford, Environmental Scientist
California Department of Water Resources
Division of Flood Management
Flood Maintenance and Operations Branch
Environmental Support Section
P.O. Box 219000
Sacramento, CA 95821-9000
bsog@water.ca.gov

Subject: BUTTE SLOUGH OUTFALL GATES REPAIR PROJECT
MITIGATED NEGATIVE DECLARATION (MND)
SCH No. 2024061069

Dear Kristin Ford:

The California Department of Fish and Wildlife (CDFW) received and reviewed the Notice of Availability of a ISMND from the California Department of Water Resources (DWR) for the Butte Slough Outfall Gates Repair Project (Project) pursuant the California Environmental Quality Act (CEQA) statute and guidelines.¹

Thank you for the opportunity to provide comments and recommendations regarding those activities involved in the Project that may affect California fish, wildlife, native plants, and their habitat. Likewise, we appreciate the opportunity to provide comments regarding those aspects of the Project that CDFW, by law, may need to exercise its own regulatory authority under the Fish and Game Code.

CDFW ROLE

CDFW is California's Trustee Agency for fish and wildlife resources and holds those resources in trust by statute for all the people of the State (Fish & G. Code, §§ 711.7, subd. (a) & 1802; Pub. Resources Code, § 21070; CEQA Guidelines § 15386, subd. (a)). CDFW, in its trustee capacity, has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species (*Id.*, § 1802.). Similarly, for purposes of CEQA, CDFW provides, as available, biological expertise during public agency environmental review efforts, focusing specifically on projects and related activities that have the potential to adversely affect fish and wildlife resources.

¹ CEQA is codified in the California Public Resources Code in section 21000 et seq. The "CEQA Guidelines" are found in Title 14 of the California Code of Regulations, commencing with section 15000.

Butte Slough Outfall Gates Repair Project

July 30, 2024

Page 2 of 11

CDFW may also act as a Responsible Agency under CEQA. (Pub. Resources Code, § 21069; CEQA Guidelines, § 15381.) CDFW expects that it may need to exercise regulatory authority as provided by the Fish and Game Code. As proposed, for example, the Project may be subject to CDFW's lake and streambed alteration regulatory authority. (Fish & G. Code, § 1600 et seq.) Likewise, to the extent implementation of the Project as proposed may result in "take" as defined by State law of any species protected under the California Endangered Species Act (CESA) (Fish & G. Code, § 2050 et seq.), the project proponent may seek related take authorization as provided by the Fish and Game Code.

PROJECT DESCRIPTION SUMMARY

The Project site is located on Butte Slough adjacent to its confluence with the Sacramento River. The project site is located approximately 5 miles downstream from the town of Colusa in both Sutter and Colusa counties and is accessed by Marty Road on the Sutter County side and Butte Slough Road on the Colusa County side.

The Project consists of repairing the outlet headwall support, replacing the existing inlet catwalk, repairing the inlet slide gates, installing a new facility control building, and installing water flow/condition monitoring equipment. Activities to repair and stabilize the outlet headwall would consist of backfilling the scour area beneath the outlet concrete headworks and applying a lightweight concrete slurry to protect exposed timber piles against future scour. Replacing the inlet catwalk requires the removal of the existing catwalk and support framing, installing four new support piles, and erecting a new catwalk system. To restore full operation of the inlet slide gates, replacement and repair of the gate actuators and related gate infrastructure would be conducted by replacing the inlet slide gates, gate frame(s), and stems; attaching and aligning the slide frames to the new catwalk; and replacing the manual slide gate actuators. The installation of a new facility control building would maintain electrical equipment necessary for facility operation and would be supported by a power generator and an above-ground propone tank. Power for the controls would be routed through a trench from an existing Pacific Gas and Electric Company pole near the control building. The Project also includes improvements to the collection and monitoring of local water flow and fisheries conditions in the Project area by installing additional small-scale resource monitoring equipment such as flag gate angle monitors or inclinometers. Installation of this equipment would be supported by operations at the facility control building.

COMMENTS AND RECOMMENDATIONS

CDFW offers the comments and recommendations presented below to assist DWR in adequately identifying and/or mitigating the Project's significant, or potentially significant, direct and indirect impacts on biological resources. CDFW has organized its comments based on the order information is presented in the ISMND.

Comment 1: Findings, page iv

Spring-run Chinook salmon (*Oncorhynchus mykiss*; SRCS) are listed as threatened under CESA and the federal Endangered Species Act (ESA). Butte Creek supports the largest of

Butte Slough Outfall Gates Repair Project

July 30, 2024

Page 3 of 11

three remaining naturally reproducing, genetically distinct populations of SRCS in the Central Valley. The Butte Creek SRCS population is considered a stronghold for the species. SRCS production in the Central Valley has declined drastically over the last few years because of drought, and CDFW is concerned about a potential collapse of the Butte Creek population. Currently one of CDFW's top priorities is to avoid additional impacts to Butte Creek SRSC to the greatest extent feasible.

The ISMND Findings 4 states "*The proposed project would not have the potential to substantially degrade the quality of the environment; substantially reduce the habitat of a fish or wildlife species; cause a fish or wildlife population to drop below self-sustaining levels; threaten to eliminate a plant or animal community; substantially reduce the number or restrict the range of an endangered, rare, or threatened species; or eliminate important examples of the major periods of California history or prehistory.*" However, the Project facility is located at the historical mouth of Butte Creek and the ISMND neglects to describe the significance of the Project facility location as the original and thence essential migratory pathway for salmon and steelhead (*Oncorhynchus mykiss*; collectively "*salmonids*") entering and exiting Butte Creek. Within the description of the Project facility operations, the ISMND states that "when stages in the Sacramento River are lower than water elevations behind the gates, the gates can be opened and drainage from Butte Slough flows through the BSOG into the Sacramento River." Before the current water control structure was built, this location was utilized by adult salmonids to access holding and spawning habitat in upper Butte Creek, and by juvenile salmonids during their outmigration from lower Butte Creek into the Sacramento River. The current structure was built without fish passage incorporated, essentially blocking fish passage for both adult and juvenile salmonids. Butte Creek water released from the BSOG facility triggers olfactory cues in adult salmonids in the Sacramento River which diverts them towards the facility. The lack of fish passage at the facility results in adult salmonids exhibiting milling behavior below the facility. State and federally threatened SRCS have been observed in multiple years milling around the facility, some of which have perished. Additionally, salmon have been documented attempting to pass through the BSOG facility (T. McReynolds, per comms, July 14, 2021) and salmon and steelhead have been trapped or caught in the existing culverts when water is being released (C.Garman 2018; CDFW unpublished data).

Rehabilitating and modernizing the flood control structure without providing fish passage substantially impacts state and federally listed salmonids in several ways, including continuing to block an essential migratory route, substantially reducing the availability of and access to holding, spawning, and rearing habitat, and reducing the range of individual species, ultimately contributing to the decline of imperiled salmonid species in Butte Creek.

To address this comment, CDFW recommends the water control structures provide fish passage for both adult and juvenile salmonid life stages. (F&G Code § 5901).

Comment 2: 2.4 Project Purpose and Objectives, page 2-5

The ISMND states the objectives of the proposed project, "*include restoring reliability and functional life to the BSOG facility; repairing the BSOG facility so that daily and*

Butte Slough Outfall Gates Repair Project

July 30, 2024

Page 4 of 11

emergency flood operations work can be conducted in a safe and efficient manner; implement a project as soon as reasonably possible to minimize ongoing safety risks during BSOG operations; and complete the necessary repairs in a manner that minimizes environmental impacts to the surrounding environment.” The Project’s proposed repairs incorporate modernizing operation of the slide gates to restore reliability and functionality of the facility, which will prolong the life of the facility and facility operations. The ISMND should include a discussion about how facility operations affect water conditions throughout the Butte Creek watershed, including stage height upstream in Butte Creek and the availability of flows downstream through Butte Slough and the Sutter Bypass. Operations of the facility influence survival and emigration rate for juvenile SRCS moving downstream as well as passage conditions for adults migrating upstream through the Sutter Bypass. Additionally, to minimize impacts to state and federally listed salmonid species, the Project should incorporate a solution for fish passage to prevent trapping adult salmon in the facility culverts when access is available through the flap gates. When adult salmon are migrating upstream in the Sacramento River, Butte Creek water from Butte Slough flowing through the facility culverts triggers olfactory cues, evidenced by CDFW observations of adult salmon exhibiting milling behavior and jumping at the culvert flap gates in multiple years (T. McReynolds, per comms, July 14, 2021). These water releases attracting adults and diverting them from the Sacramento towards the facility can cause migration delays and straying, while at the same time decreasing flows through the Sutter Bypass and therefore decreasing attraction flows for adult salmon at the bottom end of the Sutter Bypass. Further, at certain stage heights, salmon are able to access the facility culverts and can become entrained in the pipes. The long culvert distance and any change in flow may cause salmon to get trapped inside the culvert pipes and be exposed to deleterious conditions leading to mortality. The ISMND should also consider how to incorporate fish monitoring equipment into the facility to monitor salmonid activity at the facility while upgrading the control equipment, as well as how to address fish passage at the Project facility to prevent trapping adult salmon.

Comment 3: 2.5 Project Description, Resource Monitoring Capabilities, page 2-10

The ISMND indicates the project will also include improvements to the collection and monitoring of local water flow and fisheries conditions in the project area by installing additional small-scale resource monitoring equipment. However, the ISMND does not include a description of potential fisheries monitoring equipment. CDFW recommends considering adding passive fish monitoring equipment for documentation of presence during water release timing and to document behavior, movement, and other problem areas for salmonids in the Project area such as Adaptive Resolution Imaging Sonar (ARIS) cameras set inside stand-alone frames or wet wells adjacent to the gates outfall gates in the Sacramento River. Incorporating visual monitoring into the Project would provide crucial data on how fish interact at this location and inform potential future project phases.

Butte Slough Outfall Gates Repair Project

July 30, 2024

Page 5 of 11

Comment 4: 2.6 Project Construction Phasing, Equipment, and Schedule, Dewatering, page 2-16

The ISMND describes dewatering activities of the project site and indicates sump pumps within the sheet piling areas would be used to dewater the project site within Butte Slough. Any pumps used to dewater the project site need to be fitted with material that meets State and federal screening criteria for salmonids. Unscreened sump pumps have the potential to entrain fish and would be considered a significant impact. Additionally, screened pumps need to be housed in a tub or basin to act as a barrier reducing suction force and monitored continuously while in use to avoid impingement of fish. CDFW recommends incorporating language throughout the ISMND indicating all sump pumps shall be fitted with screens that meets State and federal salmonid screening criteria, housed in a tub or basin, and monitored continuously while in use to reduce Project impacts to less than significant.

Comment 5: 3.4 Biological Resources, Environmental Setting, page 3-22

The ISMND details the location and operation of the Project facility, field surveys to characterize the biological resources on and adjacent to the project site, plant community along Butte Slough, and agricultural lands occurring landside of the levees. However, this section of the ISMND neglects to describe the significance of the Project facility being located on the historic mouth of Butte Creek as described in Comment 1. The ISMND should include a description of the historical Butte Creek mouth, Butte Creek as a tributary to the Sacramento River at this location, and how the Project facility was built without fish passage incorporated.

Comment 6: 3.4 Biological Resources, 3.4.1.1.1 Special-status Fish, page 3-25

The ISMND lists special-status fish species. The Fish and Game Commission recently voted to approve white sturgeon (*Acipenser transmontanus*) as a candidate species for listing under California Endangered Species Act (CESA) on June 19, 2024. Candidate species for listing under CESA are granted full protections while the candidate review process takes place. CDFW recommends adding white sturgeon to the list of state special-status species.

Additionally, the ISMND states “*All these species are likely present within the project area, though abundance and/or presence may vary seasonally.*” CDFW has documentation of presence on an annual basis of the species listed in section 3.4.1.1.1 (per comms Tracy McReynolds). CDFW recommends removing “likely” from the statement.

Comment 7: 3.4 Biological Resources, Special-status Fish, page 3-26

The ISMND discusses SRCS using the Sutter Bypass as their main migration route to Butte Creek since the Project facility was constructed in 1935. The Project facility is located at the historic mouth of Butte Creek, where it converged with the Sacramento River. Prior to the construction of the Sutter Bypass, the mouth of Butte Creek was the main migratory pathway for salmonids entering and exiting Butte Creek. When the current

Butte Slough Outfall Gates Repair Project

July 30, 2024

Page 6 of 11

water control structure was built, fish passage was not provided, nearly entirely blocking the mouth of Butte Creek as a migratory route for salmonids. The ISMND also discusses how on rare occasions when water is released from the facility, there is limited space for fish to enter Butte Slough from the Sacramento River as the culverts are covered with flap gates that do not completely open. As described above, when Butte Creek water from Butte Slough is released at the Project facility into the Sacramento River, adult salmonid olfactory cues are triggered and they swim towards the facility and have the potential to become trapped in the culverts.

CDFW recommends the ISMND incorporate discussion of historical use of Butte Creek's mouth at the Sacramento River by salmonids and the Project's lack of adequate fish passage. Proper fish passage should be incorporated to this site pursuant to Fish and Code section 5901. Additionally, the ISMND should consider incorporating fish monitoring into the minimization and mitigation measures to reduce Project impacts as well as inform potential future project phases.

Comment 8: Mitigation Measure BIO1: Minimize Impacts on Special-status Fish and other Sensitive Biological Resources, pages viii and 3-27*First Bullet*

The ISMND mitigation measure BIO-1 discusses conducting environmental awareness training for project personnel working on the project site. CDFW recommends environmental awareness training include new information that as of June 19, 2024, the California Fish and Game Commission voted to name white sturgeon as a candidate for listing under CESA. A candidate species is afforded the same protections as a listed species during the review period.

Ninth Bullet

The ISMND mitigation measure BIO-1 discusses a fish rescue plan will be developed and implemented by DWR for approval by CDFW and NMFS prior to cofferdam installation. However, the measure lacks the fish rescue plan details on the methodology (capture and handle methods, predetermined relocations spots, how to handle injured and dead individuals, any data collected on captured/relocated individuals, etc.). CDFW recommends that the fish rescue plan be developed to include, but not be limited to: (1) a discussion of the species and habitat features; (2) a schedule for survey and monitoring species presence; (3) methods to capture, handle, and relocate individuals or habitat features out of the Project area; (4) names and qualifications of biologists who will handle the species, including the appropriate handling authorizations; and (5) description and maps of where the salvaged individuals or habitat features will be relocated to. The plan should also provide the Project's plan to respond to an atypical detection of individual(s), such as being detected inside construction materials (pipes), being detected in an uncovered pit, etc. The Project shall move fish to the nearest appropriate site outside of the Project area. The Project shall maintain a Wildlife Relocation Record that includes, at a minimum: the date of capture and of relocation; the method of capture, location of relocation in relation to the Project area; and the number, age-class and species captured

Butte Slough Outfall Gates Repair Project

July 30, 2024

Page 7 of 11

and relocated. The Wildlife Relocation Record shall also quantify the number and species of Project- and relocation-related mortality.

Additionally, the ISMND states that winter-run and SRCS are present in the Project area, therefore potential fish rescues are likely to result in take. Handling CESA-listed species will require a take authorization as “catch” and “capture” are methods of take. CDFW recommends an Incidental Take Permit is obtained for any take likely to occur over the life of the Project, including operations and maintenance. As a Responsible Agency under CEQA, CDFW will need to rely on DWR’s CEQA analysis. Therefore, CDFW recommends that mitigation measures are incorporated into the ISMND to fully mitigate Project impacts on CESA-listed species such as, but not limited to, a fish rescue plan that outlines and details the recommended requirements listed above.

Eleventh Bullet

The ISMND mitigation measure BIO-1 discusses a dewatering plan that will be prepared by DWR and submitted to CDFW and NMFS prior to commencing dewatering activities. The dewatering plan will be implemented by DWR during all dewatering activities, and pump intakes will be fitted with appropriately sized NMFS- and/or CDFW-approved fish screens to prevent fish from becoming entrained.

In addition to ensuring pump intakes will be fitted with appropriately sized NMFS- and/or CDFW- approved fish screens to prevent fish from becoming entrained, DWR should monitor screened pumps continuously while in use and set pumps in an additional tub or basin to reduce the potential for fish impingement.

Comment 9: Mitigation Measure BIO5: Minimize Impacts on Western Pond Turtle, page 3-34

Third Bullet

The ISMND mitigation measure BIO-5 includes possible capture and relocation of western pond turtle (*Emys Marmorata*) as an option. CDFW recommends the ISMND includes a more detailed capture and relocation measure for western pond turtle which include specific procedures to relocate them if necessary. The capture and relocation method should include details on the methodology (capture and handle methods, predetermined relocations spots, how to handle injured and dead individuals, any data collected on captured/relocated individuals, etc.). The additional measure should be incorporated into the appropriate ISMND section(s). An example measure is provided below:

Western Pond Turtle Relocation Plan. If Project proponent would like to relocate western pond turtle away from the Project area, Project proponent shall prepare a Relocation Plan. The Plan shall include, but not be limited to: (1) a discussion of the species and habitat features; (2) a schedule for survey and monitoring species presence; (3) methods to capture, handle, and relocate individuals or habitat features out of the Project area; (4) names and qualifications of biologists who will handle the species, including the appropriate handling authorizations; (5) specifications for Wildlife Exclusion fencing, if

Butte Slough Outfall Gates Repair Project

July 30, 2024

Page 8 of 11

appropriate, which may be installed to exclude the wildlife species from the Project area; (6) details regarding the use of coverboards which will be employed accessory to the exclusion fencing; (7) description and maps of where the salvaged individuals or habitat features will be relocated to; and (8) identification of a wildlife rehabilitation center or veterinary facility where injured individuals of the will be taken. The Plan should also provide Project proponent's plan to respond to an atypical detection of individual(s), such as being detected under construction vehicles, being detected inside construction materials (pipes), being detected in an uncovered pit, etc. Project proponent shall move wildlife to the nearest suitable habitat outside of the Project area. Project proponent shall maintain a Wildlife Relocation Record that includes, at a minimum: the date of capture and of relocation; the method of capture, location of relocation in relation to the Project area; and the number, age-class and species captured and relocated. The Wildlife Relocation Record shall also quantify the number and species of Project- and relocation-related mortality.

Comment 10: d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites, page 3-41

The ISMND states "project implementation would have minor impacts on fish migration because no changes would be made to the BSOG facility that would alter its function and operations and the project site is a minor migratory route." Although, the Sutter Bypass is considered by the ISMND to be the main current migratory route for SRCS and steelhead to and from Butte Creek due to the Project facility essentially blocking the historic mouth, adult salmonids have been documented in previous years being cued by Butte Creek water releases at the Project facility, attempting passage (T. McReynolds, per comms, July 14, 2021) , and being trapped or caught in the facility with some mortality (C.Garman 2018; CDFW unpublished data. The ISMND should acknowledge there is a lack of data available, due to a lack of monitoring equipment, to substantiate how Project implementation may affect salmonid migration through the Project facility. Before the current facility was built, salmon and steelhead used the historic Butte Creek mouth for entrance and exit of Butte Creek. The ISMND has also acknowledged there are rare occasions when water is released from the control structure and there is limited space for fish to enter Butte Slough from the Sacramento River. Any impacts to Butte Creek SRCS migration are considered significant to CDFW due to the recent significant decline of this population and its status as the stronghold for the species. The ISMND should incorporate discussion of historical use of Butte Creek's mouth by salmonids, the Project facility's lack of adequate fish passage, and the need to incorporate proper fish passage at this site pursuant to Fish and Code section 5901. The ISMND should also include and describe monitoring to guide adaptive management of the operations of the facility. CDFW recommends the Project include focused monitoring to provide data necessary to look at behavior, movement, and problem areas for salmonids in the Project area.

Comment 11: b) Would the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with

Butte Slough Outfall Gates Repair Project

July 30, 2024

Page 9 of 11

the effects of past projects, the effects of other current projects, and the effects of probable future projects.), page 3-111

The ISMND must contain a reasonable analysis of the Project's contribution in the context of the significant cumulative impacts. It must identify related projects through a list or projection to summarize effects of the related projects, and reasonably analyze the cumulative contribution of the Project, as well as provide mitigation measures for that contribution (CEQA Guidelines §15130(b)). The ISMND indicates there are *"No other past, present, or probable future projects would overlap with the project at the project site, with the exception of the existing levee, which has been in place for approximately 100 years"* and *"the project's relatively minor impacts would result from the short construction schedule and the project's specific location between an existing levee and orchard, which confines project-related impacts to a relatively small area without significant environmental resources."* However, the ISMND has failed to acknowledge the Project essentially blocks and will continue to block fish passage of SRCS at the historic Butte Creek mouth. The ISMND should include discussion of the facility's lack of adequate fish passage and the need to incorporate proper fish passage at this site in the future pursuant to Fish and Code section 5901. CDFW recommends the ISMND include a discussion of potential probable future fish passage improvement project at the Project site within the discussion of effects of probable future projects. By analyzing the cumulative impacts of present and future projects and disclosing project relationships, DWR can efficiently show a good faith effort at full disclosure to address potential significant impacts of fish passage at the Project facility and can show how all potentially significant impacts will be avoided, minimized, or mitigated.

Comment 12: Appendix B, Table B1, page B-2

The ISMND Appendix B, Table B1 does not include white sturgeon. Fish and Game Commission voted to approve white sturgeon as a candidate species for listing under CESA on June 19, 2024. White sturgeon should be added to Table B1.

ENVIRONMENTAL DATA

CEQA requires that information developed in environmental impact reports and negative declarations be incorporated into a database which may be used to make subsequent or supplemental environmental determinations (Pub. Resources Code, § 21003, subd. (e).) Accordingly, please report any special-status species and natural communities detected during Project surveys to the California Natural Diversity Database (CNDDDB). The CNDDDB field survey form can be found at the following link: <https://www.wildlife.ca.gov/Data/CNDDDB/Submitting-Data>. The completed form can be submitted online or mailed electronically to CNDDDB at the following email address: CNDDDB@wildlife.ca.gov.

FILING FEES

The Project, as proposed, would have an impact on fish and/or wildlife, and assessment of filing fees is necessary. Fees are payable upon filing of the Notice of Determination by the Lead Agency and serve to help defray the cost of environmental review by CDFW.

Butte Slough Outfall Gates Repair Project

July 30, 2024

Page 10 of 11

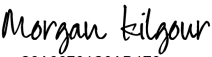
Payment of the fee is required in order for the underlying project approval to be operative, vested, and final. (Cal. Code Regs, tit. 14, § 753.5; Fish & G. Code, § 711.4; Pub. Resources Code, § 21089.)

CONCLUSION

Pursuant to Public Resources Code § 21092 and § 21092.2, CDFW requests written notification of proposed actions and pending decisions regarding the proposed project. Written notifications shall be directed to: California Department of Fish and Wildlife North Central Region, 1701 Nimbus Road, Rancho Cordova, CA 95670 or emailed to R2CEQA@wildlife.ca.gov.

CDFW appreciates the opportunity to comment on the ISMND to assist in identifying and mitigating Project impacts on biological resources. CDFW personnel are available for consultation regarding biological resources and strategies to minimize and/or mitigate impacts. Questions regarding this letter or further coordination should be directed to Lauren Mulloy, Senior Environmental Scientist (Specialist) at (916) 358-2909 or Lauren.Mulloy@wildlife.ca.gov.

Sincerely,

DocuSigned by:

C3A86764C0AD4F6...

Morgan Kilgour
Regional Manager

- ec: Billie Wilson, Supervisor
Billie.Wilson@wildlife.ca.gov
- Anna Allison, Supervisor
Anna.Allison@wildlife.ca.gov
- Lauren Mulloy, Senior Environmental Scientist
Lauren.Mulloy@wildlife.ca.gov
- Tracy McReynolds, Senior Environmental Scientist
Tracy.McReynolds@wildlife.ca.gov
- Beth Lawson, Senior Hydraulic Engineer
Beth.Lawson@wildlife.ca.gov
California Department of Fish and Wildlife
- State.Clearinghouse@opr.ca.gov
Office of Planning

Butte Slough Outfall Gates Repair Project

July 30, 2024

Page 11 of 11

REFERENCES

Garman, C. 2018. Butte Slough Outfall Gate/Wards Landing Fish Kill. California Department of Fish and Wildlife.

McReynolds, T. 2021. Sutter Bypass hydrology and subsequent fish kill. California Department of Fish and Wildlife