



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
777 Sonoma Avenue, Room 325
Santa Rosa, California 95404-4731

EXHIBIT 4-C

August 24, 2018

Refer to NMFS No: WCR-2017-7369

Richard Svindland, President
California-American Water Company
655 West Broadway, Suite 1410
San Diego, California 92101

David Stoldt, General Manager
Monterey Peninsula Water Management District
P.O. Box 85
Monterey, California 93942-0085

Re: NOAA's NMFS' comments on the Monterey Peninsula Water Management Districts' draft
Instream Flow Incremental Methodology report for the Carmel River, California

Dear Mr. Svindland and Mr. Stoldt:

On April 17, 2018, NOAA's National Marine Fisheries Service (NMFS) submitted its comments on the Instream Flow Incremental Methodology (IFIM) study report prepared by Normandeau Associates for the Monterey Peninsula Water Management District (MPWMD). During a June 20, 2018, conference call between NMFS, California Department of Fish and Wildlife (CDFW), and MPWMD, we agreed to provide our final recommendations to the MPWMD regarding finalization of the IFIM study.

We acknowledge that the intended goals and objectives of the study (i.e., identify minimum depths for adult passage, test transferability of habitat suitability curves, and provide estimates of spawning and rearing habitat for the geomorphic conditions present when the study was conducted) were addressed. However, we have prepared the accompanying technical memorandum that outlines specific limitations of the study and our concerns with the applicability of these results for determining future instream flows in the Carmel River. At this time, NMFS has no objection to finalizing the IFIM study provided the context and limitations of the study outlined in the technical memorandum are acknowledged in the final report. The technical memorandum also identifies additional studies that will help inform future hydrologic and geomorphic conditions in the Carmel River under different management scenarios (e.g. removal or retention of Los Padres Dam, reduced groundwater overdraft). These include, conducting a geomorphic assessment of historic, current, and predicted channel morphology, a limiting factors analysis, and assessing fish passage opportunities.

There are other ongoing studies that are intended to inform future water availability, sediment transport and river morphology, instream flows, habitat connectivity and the potential effects on steelhead in the Carmel River mainstem under different management scenarios. These



include the Carmel Basin Hydrologic Model, the Los Padres Reservoir Sediment Management Alternatives analysis, and steelhead population studies conducted by the NOAA's Southwest Fisheries Science Center and MPWMD. Before MPWMD and California-American Water Company (CAW) move forward with developing any final instream flow targets or begin writing the Effects on Steelhead Technical Memorandum, we would like to review and comment upon the reports from the aforementioned ongoing studies and review an outline of the proposed Effects on Steelhead Technical Memorandum.

The IFIM study was identified in the Memorandum of Agreement (MOA) between CAW, NMFS, and the California Coastal Conservancy (Parties) as one of many studies to inform the Los Padres Dam (LPD) Feasibility Study. NMFS appreciates MPWMD and CAW's efforts to complete this study in order to meet specified deadlines in the MOA. We realize our request to halt progress towards completing the Effects on Steelhead Technical Memorandum will likely prevent CAW and MPWMD from meeting the deadline specified in the MOA for completing the LPD Feasibility Study (June 30, 2019). However, in anticipation of potential technical and permitting delays, the Parties to the MOA included allowances in the MOA for additional studies and alternative study deadlines to be discussed and agreed upon (Section IV.A.1.b). Thus, following our review of the ongoing studies and Effects to Steelhead Technical Memorandum outline, we would like to meet with CAW to discuss whether additional studies are needed and if the deadlines proposed in the MOA should be revised to accommodate these studies.

We look forward to continuing our collaborative process towards completing the Los Padres Dam Feasibility Study. Please contact Joel Casagrande at 707-575-6016 or at Joel.Casagrande@noaa.gov if you have any questions regarding this letter.

Sincerely,

A handwritten signature in black ink, appearing to read "A. Van Atta" followed by a stylized flourish.

Alecia Van Atta
Assistant Regional Administrator
California Coastal Office

Enclosure

cc: Julio A. Gonzalez, CAW, Carmel
Larry Hampson, MPWMD, Monterey
Trish Chapman, State Coastal Conservancy, Oakland
Copy to ARN 151422WCR2017SR00186
Copy to Chron File

NMFS Technical Memorandum



To: Monterey Peninsula Water Management District (MPWMD)
From: National Marine Fisheries Service (NMFS)
Date: August 24, 2018
Subject: Los Padres Dam (LPD) IFIM Study
NMFS Contacts: David Crowder, Ph.D. and Joel Casagrande

PURPOSE: On June 20, 2018, the Los Padres Dam Technical Review Committee (TRC) had a teleconference to discuss NMFS' April 27, 2018, comments regarding the final draft IFIM study report (Normandeau Associates, 2017). During the June 20 teleconference, NMFS was asked to provide a follow-up memo describing NMFS recommendations for finalizing the IFIM study report. The following comments are NMFS' recommendations for helping address the major themes and concerns NMFS conveyed via email on April 27, 2018 and during the June 20, 2018 call. NMFS hopes these recommendations, if implemented, will allow the Draft Final IFIM study to be completed without having to address each of NMFS' comments point by point and without substantial back and forth discussions and comments.

GENERAL RECOMMENDATIONS FOR FINISHING REPORT:

1. NMFS recommends that the goals and objectives of this study be stated in terms of its context and utility within the suite of studies currently being conducted for LPD. The report does not state how the results can be interpreted to yield meaningful instream flow recommendations, given that river cross-sections and geomorphic characteristics have changed over time, and likely under LPD future scenario to change more in the future. Also, the report does not identify what additional analyses or studies are needed before a final instream flows recommendation can be made. While Normandeau Associates (2017) states that these results will be used to help establish instream flows, the report inherently assumes that the reader knows how and to what extent these results can and will be utilized in the future. Specifically, the report appears to assume: (a) the reader knows how the dam is currently operated; (b) the dam will remain in place and continue to operate as it currently does; (c) the reader knows when and for how long instream flows will be implemented within any given year; (d) maintaining the dam is desirable in order to provide spawning and rearing habitat in portions of the river that may have historically gone dry during dry years and/or during certain months; and (e) limiting factors to increasing anadromous salmonid abundance and diversity within the watershed have been correctly identified and are independent of the IFIM study and the setting of instream flows. It is not clear to NMFS that any of these assumptions are correct, particularly given the fact that a variety of different river management and dam alternatives are under consideration at this time -including: various sediment management scenarios; fish passage alternatives; and dam modification or removal.

2. The primary goals of Normandeau Associates (2017) were: (a) determine the minimum discharge that would provide barely passable conditions (i.e., minimum depth, max velocity, and minimum passageway width) at critical riffles; (b) test the transferability of various habitat suitability curves; and (c) estimate how much spawning and rearing habitat would be available under the bathymetry conditions mapped at the time of the study at various low to moderate discharges. While NMFS concurs these goals were met, the actual utility of these results remains unclear, particularly with respect to if, or how, they can be used to help compare various sediment management scenarios, compare various fish passage alternatives, and inform the feasibility of removing LPD. Specifically, how the study methodology's assumptions and limitations affect the accuracy and utility of the study results are not extensively addressed. Some of the limitations that need to be stated and put in context are described below.
3. A primary limitation of the PHABSIM and the 2-D model results is that they are highly dependent upon the channel bathymetry not changing from the time the channel was mapped. Channel bathymetry data and cross-section selections are critical inputs which drive model results. This is problematic as there are multiple reasons for believing the bathymetry of the channel has already changed since the original mapping occurred, and will substantially change into the future. These reasons include: (a) channel morphology is constantly in flux, particularly in a Mediterranean climate driven by the El-Nino Southern Oscillation; which is typified by periods of drought followed by wet years having large storm events capable of significantly reworking the channel bathymetry; (b) much of the bathymetry data was collected at the end of a substantial drought period and just before the first large storm events following the removal of San Clemente Dam; (c) San Clemente Dam was only recently removed and the channel may still be adjusting to the re-establishment of sediment transport processes in the river; (d) future sediment releases from LPD, or removing LPD, would significantly alter sediment inputs and could substantially alter portions of the channel's bathymetry downstream of the dam; and (e) several different sediment management scenarios are being considered for LPD and each of these scenarios will likely change the channel conditions over time. Consequently, the PHABSIM results are solely limited to estimating the amount of spawning and rearing habitat that would occur at various discharges under the channel bathymetry that existed at the time that depth and velocity calibration data was collected. For this reason, NMFS currently believes that it would be inappropriate to use the PHABSIM results obtained in this study to predict the types and amounts of habitats that will exist subsequent to any significant changes in sediment inputs or sediment management practices, or after a few ENSO cycles. NMFS recommends the final report clearly states that the results are applicable to the channel configuration existing at the time the bathymetry and depth/velocity measurements were taken to calibrate/run the PHABSIM and 2-D models. A discussion on how this limitation prevents using these results to conjecture on how various LPD sediment management alternatives and/or removing the dam will have on habitat is also recommended.

4. A second important limitation of the PHABSIM study is that habitat suitability is only defined in terms of the variables used in the Habitat Suitability Curves. Any variables that may be equally or more important to why fish selected and/or prefer a particular habitat are thus not accounted for in the amount of unsuitable, suitable, and preferred habitat estimated by PHABSIM. Failure to correctly account for all the variables to characterize unsuitable, suitable and preferred habitat can significantly overestimate the types of habitat available within the river at any given discharge. For example if one uses only depth, velocity, and distance to cover to define what is unsuitable, suitable, and preferred habitat via an HSC, PHABSIM will treat two locations/areas with the same depth, velocity and distance to cover as equally suitable habitat regardless of the temperature, dissolved oxygen, salinity, and/or spatial flow patterns around these two locations. This may have profound implications upon the accuracy at which PHABSIM can estimate the locations and total amount of useable/preferred habitat when one considers factors including (but not limited to) the following: (a) water temperatures may vary dramatically temporally and spatially throughout the watershed; (b) algae blooms in specific locations of the watershed may reduce or deplete oxygen levels at night; (c) predation rates may differ spatially throughout the watershed; and (d) redds may benefit from upwelling, down-welling or other spatially varying flows that aerate the eggs within a redd and prevent siltation from smothering the eggs. If any of the above (or other) variables are not incorporated in the HSC (which may occur spatially and temporally within the watershed), but play a role in determining what constitutes suitable and/or preferred habitat, PHABSIM will most likely overestimate the amount and/or time at which useable or preferred habitat exist within the watershed. A primary concern with this study is that spawning habitat does not appear to be equally and randomly spread throughout the watershed. Instead, the study focused on collecting depth, velocity, and substrate size data at specific locations that fish were known to spawn because fish were not routinely spawning elsewhere. Yet there is no evidence to suggest that there are not numerous other locations within the river that have similar depth, velocity and substrate size values that according to PHABSIM would be equally suitable for spawning. This suggests that there may be one or more variables that are not being accounted for when it comes to describing suitable and preferred spawning habitat and that the current PHABSIM's estimated area of spawning habitat are overestimated by an unknown amount.
5. A crucial element of increasing the abundance and diversity of anadromous salmonids within the study watershed is to identify and eliminate any limiting factors, some of which may be caused (or exacerbated) by the presence and operation of Los Padres Dam. It is not apparent that all of the potential limiting factors that could influence if, or how, LPD should be operated have been considered. Instead, this study inherently assumes that simply maximizing spawning and rearing habitat downstream of LPD will eliminate/mitigate all of the potential limiting factors that LPD may be contributing toward. Some possible limiting factors that may need to be carefully considered are: (a) timing and duration of hydrologic events; (b) dam operations which cause the estuary and mainstem to become disconnected from the ocean; (c) poor water quality (which may be influenced by instream flow

recommendations), d) loss of historic habitats that could be regained to some extent by removing LPD or modifying how it is operated; (e) reduction or loss of access to cold headwater habitats above LPD to maintain a resident steelhead population (which would contribute to genetic/life-history diversity, produce anadromous out-migrants, and provide a buffer against climate change); and (f) introduction of invasive species and increased predation due to artificially created instream flow releases and/or ponding of water. NMFS recommends that the report state that adopting instream flows based upon the results of these PHABSIM results by themselves does not necessarily identify, eliminate and/or mitigate all of the limiting factors associated with maintaining and operating LPD. It should also emphasize that the results merely predict the amounts of spawning and rearing habitat that would exist below LPD under the bathymetric conditions that existed at the time the study was conducted. It should also be noted that the most recent habitat mapping showed the channel has changed since much of the river was mapped and, thus, the PHABSIM results are already out of date.

6. During the June 20, 2018, teleconference, it was stated that the accuracy at which PHABSIM predicts the amounts of habitat available within a stream is not a major concern because the goal of PHABSIM is not to predict the amount of available habitat, but to be an Index. NMFS requests clarification on what was meant by this statement and what the purpose of PHABSIM is if its major goal is not to estimate the quality and amount of various types of habitat (e.g. spawning and rearing habitats) at various discharges within a river. NMFS agrees that one could normalize the predicted amounts of habitat to compare differences in habitat amounts at two different discharges. However, this assumes that all of the habitat area estimates have the same amount of potential error, which is not the case, as one is extrapolating hydraulic parameters from values measured at a known discharge to predict hydraulic parameters at a different discharge. Consequently, there tends to be more error for estimates at non-calibrated discharges. Moreover, one cannot extrapolate or interpolate results to a channel that has changed its geometry as a channel's geometry plays a significant role on the resulting flow field (e.g. depth, velocities, and hydraulic complexity). Thus, NMFS believes it is important to highlight the limitations to which PHABSIM can predict different amounts of suitable, unsuitable, and preferred habitat.
7. NMFS recommends that the final report state that before one recommends any instream flows that the biological benefits (if any) and feasibility of removing Los Padres dam (and various sediment management alternatives) first be fully assessed and that at least three additional studies to facilitate that process be conducted: 1) a geomorphic assessment of historic, existing, and predicted channel conditions within the watershed; 2) a limiting conditions analysis (incorporating the results of any fish marking and recapture studies); and 3) a fish passage opportunity study demonstrating how much passage opportunity is being lost and/or gained compared to historic, existing, and any proposed actions being considered. NMFS further recommends that MPWMD work with NMFS to determine the scope and analyses appropriate for these studies. For example, the fish passage opportunity study

NMFS is proposing goes beyond determining the minimum discharge at which fish are able to pass the critical riffles as done in this report. A fish passage opportunity study would focus on the timing, frequency, and duration to which steelhead historically had access to various habitats (e.g. spawning, rearing, floodplain/backwater, etc.) and how that opportunity has changed or will change under existing and proposed conditions. This information, in turn, will be used to help assess and identify potential limiting factors and means of eliminating limiting factors.

REFERENCES:

Normandeau Associates. 2017. Assessing Instream Flow Requirements for Steelhead in the Carmel River, California. Final Report. November 30, 2017.