RESPONSE TO FEBRUARY 16, 2018 REQUEST FOR ADDITIONAL INFORMATION, RESOURCE AGENCY LATE FILING, AND OTHER RELATED INFORMATION

ATTACHMENT Q

REVIEW OF A SAMPLE OF CITATIONS USED IN SUPPORT OF PROPOSED SECTION 10(J) RECOMMENDATIONS IN RESPONSE TO THE FERC REA NOTICES

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Review of a Sample of Citations Used in Support of Proposed Section 10(j) Recommendations in Response to the FERC REA Notices.

No	Citation	Pg No.	Full Reference	Context of Citation	Analysis
USFWS JANUARY 29TH COMMENT LETTER IN RESPONSE TO THE FERC REA NOTICES					
1.	Hayes *et al.* 2008	17	Hayes, S.A., M.H. Bond, C.V. Hanson, E.V. Freund, J.J. Smith, E.C. Anderson, A.J. Ammann, and R.B. MacFarlane. 2008. Steelhead growth in a small central California watershed: upstream and estuarine rearing patterns. Transactions of the American Fisheries Society 137:114-128.	USFWS states: "Access to an active, vegetated floodplain and riparian area results in positive, population-level effects to steelhead trout (Hayes *et al.* 2008), and the benefit of off-channel and floodplain access to Chinook salmon survivorship has been well established (Jeffres *et al.* 2008, Limm and Marchetti 2009, Sommer *et al.* 2005)."	Hayes et al (2008) compared *O. mykiss* growth in a coastal lagoon to the upper watershed of the coastal stream (Scott Creek). The word "floodplain" does not occur in the article and there is no comparison of growth or survival of floodplain-reared fish vs. in-channel reared fish. There is no data in Hayes et al. (2008) supportive of USFWS's contention.
2.	Jeffres *et al.* 2008	17	Jeffres C.A., J.J. Opperman, and P.B. Moyle. 2008. Ephemeral floodplain habitats provide best growth conditions for juvenile Chinook salmon in a California river. Environmental Biology of Fishes 83(4):449-458.		Jeffres et al. (2008) does not study, report on, or make any independent findings about a relationship between floodplain access and Chinook salmon survival. Jeffres et al. (2008) includes references to other studies when asserting a relationship between size at river exit and survival. Regarding growth of juvenile Chinook, Jeffres et al. (2008) actually found that juvenile Chinook reared in enclosures in the river channel upstream of the floodplain site grew at a similar rate as juvenile Chinook in the enclosure on the floodplain site. Jeffres et al. (2008) states: In the 2004 sample, "the final time that the fish were sampled, 32 days after deployment, fish in the river site upstream of the floodplain were statistically grouped [related to growth] with the fish in ephemeral floodplain sites, with greater lengths than fish placed in both the lower pond and river below the floodplain habitats." In the 2005 sample, Jeffres et al. reports: "The first time that all of the locations were sampled, 20 days after initial deployment, fish in the flooded vegetation, upper pond, and above the floodplain had increased in length significantly more than fish in the lower pond and below the floodplain". Finally, Jeffres et al. (2008) states: "We were unable to sample the fish again for 22 days (41 days after initial deployment), due to high river discharge. When next sampled, enclosures in the river above the floodplain had no fish in them. The enclosures were all structurally sound and four were partially buried in sand. It is likely that the fish perished from the effects of suspended particles during the previous high flow event." And finally, concerning the juveniles in the enclosure in the river upstream of the floodplain, Jeffres et al. (2008) states: "The fish most likely died because there was no escape from high velocities where the enclosures were located. During high flow events, wild salmon in the river would likely move downstream to the restored floodplain, where rearing conditions are favorable, or to intertidal habitat where rearing conditions are less favorable. Wild juvenile salmon in the river may have been able to avoid the high velocities."

No	Citation	Pg No.	Full Reference	Context of Citation	Analysis
3.	Limm and Marchetti 2009	17	Limm, M.P. and M.P. Marchetti. 2009. Juvenile Chinook salmon (Oncorhynchus tshawytscha) growth in off- channel and main-channel habitats on the Sacramento River, CA using otolith increment widths. Environmental Biology of Fishes 85:141-151.		Limm and Marchetti (2009) examined fall-run Chinook otoliths of fish sampled from main channels, off-channel ponds, and non-natal tributaries in the upper Sacramento River to try to differentiate growth rates from these different habitats. Contrary to USFWS's assertion, survival rates due to using the different habitats were not studied. Nor was floodplain use strictly studied as off-channel ponds represent only one form of floodplain habitat and these are generally rare on the Tuolumne River floodplain. However, the Limm and Marchetti (2009) study points to the potential value of otolith studies for determining river-specific growth rates and other information. The Districts, in coordination with CDFW and UC Santa Cruz, conducted a study of the otoliths of fall-run Chinook adults returning to the Tuolumne River from various outmigration water years (see TID/MID 2016, W&AR-11). Based upon the sampling years and otoliths available for analysis by this study, it is apparent that spawning populations in the Tuolumne River exhibit low representation of early emigrating fry, with zero contributions in three out of five outmigration years analyzed and a maximum contribution of 5% in WY 2000.
4.	Sommer *et al.* 2005	17	Sommer, T. R., W. C. Harrel, and M. L. Nobriga. 2005. Habitat use and stranding risk of juvenile Chinook salmon on a seasonal floodplain. North American Journal of Fisheries Management 25:1493-1504.		In actuality, Sommer et al. (2005) may not be helpful to USFWS's intended assertion about floodplain access and survival. Based on Brown (2002), the Sommer et al. (2005) report acknowledges it is "still unknown whether seasonally dewatered habitats are a net 'source' or a 'sink' for salmonid production relative to production in permanent stream channels." Stranding of juvenile fish is cited in Sommer et al. (2005) as a potential concern. There is no definitive assessment of stranding risk on the Tuolumne River floodplain. Sommer et al. (2005) conducted detailed assessment of the potential for stranding risk on the Yolo Bypass. But Sommer et al. (2005) also makes it clear: "Finally, we wish to acknowledge that even natural floodplain or well-designed restored floodplain habitat could at least occasionally be a population sink because of stranding or predation losses. Our study was conducted over 3 years for a single, large floodplain; we cannot rule out the possibility that floodplains may not have net benefits in other years or location."
5.	Limm and Marchetti 2009	17	[provided above]	USFWS states: "Chinook salmon and steelhead trout that rear in off-channel areas have greater growth rates than those that rear in the river channel (Limm and Marchetti 2009), and juvenile Chinook salmon with greater size and growth rates have higher survivorship in low recruitment years (Magnusson and Hilborn 2003, Woodson *et al.* 2013)."	Limm and Marchetti (2009) did not study or provide any findings related to steelhead or *O. mykiss;* therefore citing to Limm and Marchetti et al. (2009) is misplaced. See Districts' citation review in NMFS section of this table (row No. 116) below for further discussion.
6.	Magnusson and Hilborn 2003	17	Magnusson, A., and R. Hilborn. 2003. Estuarine influence on survival rates of coho (Oncorhynchus kisutch) and Chinook salmon (Oncorhynchus tshawytscha) released from hatcheries on the US Pacific coast. Estuaries and Coasts 26(4):1094-1103.		Magnuson and Hilborn (2003) studied estuarine influence on survival for estuaries in Washington and Oregon comparing survival of hatchery released coho and Chinook salmon. Only one estuary in CA was included, the Mad River in northern CA. Citing to Magnusson and Hilborn (2003) as implying a relationship between rearing in riverine off-channel areas and higher survival is tenuous at best. Magnuson and Hilborn (2003) investigated the potential relationship between estuary conditions and survival of hatchery coho and Chinook; this study has no apparent relevance to conditions in the Tuolumne River or the Bay-Delta.
7.	Woodson *et al.* 2013	17	Woodson, L.E., B.K. Wells, P.K. Weber, R.B. MacFarlane, G.E. Whitman, and R.C. Johnson. 2013. Size, growth, and origin-dependent mortality of juvenile Chinook salmon Oncorhynchus tshawytscha during early ocean residence. Marine Ecology Progress Series 487:163-175.		Woodson et al. (2013) studied differential growth and survival in hatchery-reared vs naturally-reared fall-run Chinook in the estuarine and ocean environment. In 2005, when ocean upwelling conditions were out of sync with arrival of juvenile fall-run Chinook exiting the Bay-Delta estuary, the study detected a significant effect of both size and growth-rate selective mortality that appeared independent of fish rearing origin (hatchery vs. natural). Mortality appeared to have occurred early in the ocean life history. The study notes that hatchery fish exhibit significantly larger body sizes and faster growth before ocean entry. The study reported that only the larger, faster-growing individuals survived the first month at sea in 2005. The study appears to support the hypothesis that hatchery fish may have a favorable survival bias during poor ocean conditions. The USFWS use of this citation to imply poor in-river growth rates is misplaced.

No	Citation	Pg No.	Full Reference	Context of Citation	Analysis
8.	Mesick *et al.* (2008)	18	Mesick, C., J. McLain, D. Marston, and T. Heyne. 2008. Limiting factor analyses & recommended studies for fall-run Chinook salmon and rainbow trout in the Tuolumne River. U.S. Fish and Wildlife Service Anadromous Fish Restoration Program, Lodi, California. August 13, 2008. 96pp.	USFWS states: "Mesick *et al.* (2008) found that the number of adult Tuolumne River fall-run Chinook salmon produced as a given spring flow had declined significantly, by approximately 50% after implementation of the 1996 FERC Settlement Agreement (FSA) and revised license conditions."	The Districts have attempted using data requests through the California Public Records Act to obtain the data used in the cited study Mesick et al. (2008) in order to reproduce the analyses and results claimed in this study, especially data related to any distinction made between hatchery and naturally-spawned fish returning as adults. This data has not been able to be located by the agency. Lacking reproducibility, reliance on this study is unwarranted. Likewise, the Districts have requested a copy of Mesick, Marston, and Heyne (2007) which appears to be a description of the methodology employed in the development of Mesicket al. (2008). This paper has not been provided as well.
9.	Magnusson and Hilborn (2003)	18	[provided above]	USFWS states: "The USFWS is concerned that the essential life-history stage of juvenile rearing has not been adequately addressed either through the ILP process or through the lower Tuolumne River flows proposed in the AFLA. There is an absence of explanation about how flows affect juvenile salmonid rearing habitat and how the limited access of juvenile fish to the floodplain may affect juvenile salmonid survival in the lower Tuolumne River. This information is necessary to inform a decision on return rates for salmon. In the absence of such data, the Districts' conclusion that low return rates are a result of out-of-basin mortality influences is not supported by evidence in the record, and cannot support a similar finding by the Commission. In addition, the size-recruitment relationship described by Magnusson and Hilborn (2003) and Woodson *et al.* (2013) has not been addressed."	This paragraph appears to discuss juvenile rearing on the Tuolumne River. USFWS first asserts there is an "absence of explanation about how flows affect juvenile salmonid rearing habitat" and the effect of "limited" floodplain access on survival. This is incorrect. The Districts present data, studies and models on just this aspect of the Tuolumne River fisheries, including IFIM PHABSIM studies of both instream and floodplain habitat, synthesis of available data on this very subject (TID/MID 2013a, W&AR-05), a mechanistic fall-run Chinook and *O. mykiss* population models (TID/MID 2017a, W&AR-06; TID/MID 2017b, W&AR-10) which specifically examine juvenile life stages, a Tuolumne River Otolith Study (TID/MID 2016, W&AR-11) which characterizes the fry and juvenile life stages, and numerous other reports on seining an snorkel surveys and the associated habitats, and a floodplain habitat study (TID/MID 2017c, W&AR-21), all of which USFWS has apparently chosen to ignore in favor of citing to studies having little or nothing to do with juvenile salmonids on the Tuolumne River. Neither Magnusson and Hilborn (2003) nor Woodson et al. (2013), while fine studies, present any useful information about Tuolumne River salmonids. USFWS presents no evidence of problems of size-at-exit of Tuolumne River fisheries. Magnuson and Hilborn (2003) studies estuary conditions, not river conditions.
10.	Woodson *et al.* (2013)	18	[provided above]		
11.	Mesick *et al.* (2008)	18	[provided above]	USFWS states: "Mesick *et al.* (2008) conducted a limiting factor analysis for the Tuolumne River and found that releases at La Grange from March 1 to June 15 are highly correlated (adj-R2 = 0.82, P = 0.0005) with the number of Tuolumne River smolt outmigrants passing the rotary screw traps at RM 5.3 and significantly affect fall-run Chinook salmon abundance in the Tuolumne River (adj-R2 = 0.96, P = 0.0004)."	The Districts have attempted using data requests through the California Public Records Act to obtain the data used in the cited study Mesick et al. (2008) in order to reproduce the analyses and results claimed in this study, especially data related to any distinction made between hatchery and naturally-spawned fish returning as adults. This data has not been able to be located by the agency. Lacking reproducibility, reliance on this study is unwarranted.
12.	Mesick (2009)	18	Mesick, C. 2009. The high risk of extinction for the natural fall-run Chinook salmon population in the lower Tuolumne River due to insufficient instream flow releases. Prepared for USFWS, Sacramento, California. September 4, 2009. 43pp.	USFWS states: "In addition, Mesick (2009) concluded that, during managed flow releases, the rearing habitat in the Tuolumne River can support the progeny of no more than about 434 adult fall-run Chinook salmon."	Detailed ILP studies examined the fry and juvenile fall-run Chinook and *O. mykiss* habitat using the results of river-specific substrate, depths and velocities under varying flow conditions; Mesick (2009) did not use detailed habitat data. The ILP studies were explicitly designed to generate and assess updated, site-specific data to better detail the more generalized and nearly decade-old Mesick study data. This comment indicates a bias towards relying on outdated data instead of recent data developed through the ILP.
13.	Adams *et al.* 2011	18	Adams, P.B., L.B. Boydstun, S.P. Gallagher, M.K. Lacy, T. McDonald, and K.E. Shaffer. 2011. California coastal salmonid population monitoring: strategy, design, and methods. Fish Bulletin 180. State of California, The Natural Resources Agency, Department of Fish and Game. 82 pages	USFWS states: "The entire suite of methods for life cycle monitoring currently used in some coastal California streams (Adams *et al.* 2011) may be difficult to implement on larger rivers such as the Tuolumne River, but the concepts of assessing life-stage-specific effects on populations certainly are applicable."	As part of the Don Pedro ILP, the Districts developed fall-run Chinook and *O. mykiss* in-river population models using life-stage-specific data collected on the Tuolumne River, provided the models to relicensing participants, and conducted training workshops on how to use the models. The USFWS apparently did not use these models in developing flow recommendations.

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14.	Achord *et al.* 2007	18	Achord, S., R.W. Zabel, and B.P. Sandford. 2007. Migration timing, growth, and estimated parr-to-smolt survival rates of wild Snake River spring–summer Chinook salmon from the Salmon River basin, Idaho, to the lower Snake River. Transactions of the American Fisheries Society, 136(1):142-154.	USFWS states: "Rates such as parr-to-smolt and smolt-to-adult survival have been estimated (e.g., Petrosky *et al.* 2001; Achord *et al.* 2007; Chesney *et al.* 2009; USFWS 2010)."	The connection between wild Snake River spring-summer Chinook survival rates and Tuolumne River fall-run Chinook is not explained. Implying similarity is not justified and reliance on this study is unwarranted.
15.	SJRRP 2012	18-19	San Joaquin River Restoration Program (SJRRP). 2012. Minimum Floodplain Habitat Area for Spring and Fall-Run Chinook Salmon. November 2012. http://www.restoresjr.net/download/program-documents/program-docs 2012/20121127_MinimumRearingHabitat.pdf	USFWS states: "This robust [ESHE] model has been widely used in the Central Valley including in: the San Joaquin "Minimum Floodplain Habitat Area for Spring and Fall-Run Chinook Salmon" (SJRRP 2012) report, the Central Valley Flood Protection Plan Conservation Strategy (CDWR 2017), and efforts by the State of California to develop goals and objectives for San Joaquin tributaries."	The ESHE model has not been subject to the necessary development process embodied in the ILP. There was no study plan, review and comment period, workshops to discuss issues and concerns. The Districts have not been afforded any detailed documentation. On the other hand the W&AR-05 (TID/MID 2013a), W&AR-06 (TID/MID 2017a), and W&AR-10 (TID/MID 2017b) population models were developed through this rigorous process as required under the ILP.
16.	CDWR 2017	18-19	California Department of Water Resources (CDWR). 2017. Central Valley Flood Protection Plan 2017 Update. 184 pp. http://www.water.ca.gov/cvfmp/docs/CVFPP-2017-CVFPP- Update-Draft.pdf		
17.	Cramer Fish Sciences, Unpublished Data	19	No reference provided	USFWS states: "The ESHE model found that the amount of rearing habitat needed to support CVPIA salmon doubling goals in the lower Tuolumne River is 2,700 acres—assuming 30% habitat suitability (Cramer Fish Sciences, Unpublished Data)."	Citing to unpublished data, then not submitting it as part of the filing, limits the value of the citation. USFWS must submit the "unpublished data" to allow all parties an opportunity for review and comment.
18.	Beam 1983	19	Beam, J.H. 1983. The effect of annual water level management on population trends of white crappie in Elk City Reservoir, Kansas. North American Journal of Fisheries Management	USFWS states: "Acre-days has been used as a metric in fisheries management (Beam 1983), forage availability for livestock (Campbell 1963), shellfish harvest opportunities (Trowbridge 2006, Trowbridge 2009), foraging rates in fish culture (Schrader *et al.* 2011), aquatic harvest yield (Hauser 1984) and terrestrial harvest yield (Wilks and Murphy 1985)."	The use of "acre-days" as a metric to gauge the benefit to salmonids for use of floodplains is an invention of the USFWS and its use as a proven metric is not supported by any of the citations provided. Beam (1983) is the sole citation which dealt with fish species in the wild. Beam (1983) reports on a study of the effects of reservoir level management on white crappie in an impoundment in Kansas. The study concluded the following: *"However, the hectare-days of flooded vegetation during the spawning season were not significantly related to the increase in crappie numbers…"* The studies applicability to floodplain use by salmonids is not explained.
19.	USFWS 2014	20	USFWS. 2014. Identification of the instream flow requirements for Anadromous fish in the streams within the Central Valley of California and fisheries investigations - Annual progress report fiscal year 2014	USFWS states: "The analysis for the Tuolumne River was provided to the Commission in USFWS comments on October 1, 2015 (FERC Accession Number 20151002-5019) and the analysis for the Stanislaus River is attached herein (Attachment 1, USFWS 2014)."	The USFWS October 1, 2015 comment letter on the Districts' W&AR-21 Floodplain Hydraulic Study states that any PM&E measures dealing with fry and juvenile salmonid rearing habitat shall be based on a habitat cell of "one-foot scale". In Attachment 5 to the USFWS January 29, 2018, comment letter, USFWS develops its recommendation for needed Tuolumne River floodplain rearing habitat based on inundated acres making "no assumptions of how suitable the inundated areas are for rearing salmonids." The Districts detailed review of the USFWS Attachment 5 to the January 29, 2018 comment letter is provided as a separate section of this May 14, 2018 filing (See section 7.0 of this filing, Attachments T and U).
20.	Allan *et al.* 2003	21	Allan, J. D., M. S. Wipfli, J. P. Caouette, A. Prussian, and J. Rodgers. 2003. Influence ofstreamside vegetation on inputs of terrestrial invertebrates to salmonid food webs Canadian Journal of Fisheries and Aquatic Sciences 60:309–320.	USFWS states: "The riparian tree energy and biomass contributes to the food chain, and terrestrially-derived invertebrate inputs contribute to 50 to 80 % of salmonid biomass (Allan *et al.* 2003, Kawaguchi *et al.* 2003)."	Districts studies on BMI have shown there to be a robust food supply in the Tuolumne River (see TID/MID 2010, Report 2009-7). USFWS cites no specific evidence to suggest Tuolumne River fisheries lack adequate food sources or that BMI populations are in poor condition.

No	Citation	Pg No.	Full Reference	Context of Citation	Analysis
21.	Bovee and Scott 2002	21	Bovee, K.D. and M.L. Scott. 2002. Implications of flood pulse flow restoration for Populus regeneration on the upper Missouri River. River Research and Applications 18:287-298.	USFWS states: "A river's flow regime affects the ability of that river to recruit large overstory trees and to support diverse riparian structure and composition (Bovee and Scott 2002; Lytle and Poff 2004; Poff *et al.* 2007; Poff and Zimmerman 2010; Richter and Richter 2000)."	The Districts conducted a study of riparian vegetation along the Tuolumne River (see TID/MID 2013c, W&AR-19). Studies of the upper Missouri River have little to no relationship to the Tuolumne River. Many of the USFWS citations point out the importance of local conditions and the need for site-specific information.
22.	Bilby *et al.* 1996	22	Bilby, R.E., B.R. Fransen, and P.A. Bisson. 1996. Incorporation of nitrogen and carbon from spawning coho salmon into the trophic system of small streams: evidence from stable isotopes. Canadian Journal of Fisheries and Aquatic Sciences 53: 164–173.	USFWS states: "A deficiency in marine-derived nutrients reduces the ability of the ecosystem to support large numbers of stream invertebrates and reduces the quantity available food resources for juvenile salmonids rearing (Bilby *et al.* 1996, Bilby *et al.* 1998, Moore *et al.* 2007, Wipfli and Baxter 2010, Zhang 2003)."	None of these citations have any relevance to the quantity of invertebrates in the Tuolumne River. There is no specific evidence or information presented by USFWS showing a lack of or deficiency in BMI populations in the Tuolumne River. On the contrary, the Districts studies demonstrate robust BMI populations (see TID/MID 2010, Report 2009-7).
23.	Bilby *et al.* 1998	22	Bilby, R.E., B.R. Fransen, P.A. Bisson, and J.K. Walter. 1998. Response of juvenile coho salmon (Oncorhynchus kisutch) and steelhead (Oncorhynchus mykiss) to the addition of salmon carcasses to two streams in southwestern Washington , USA. Canadian Journal of Fisheries and Aquatic Sciences 55: 1909–1918.		
24.	Moore *et al.* 2007	22	Moore, R.D., D.L. Spittlehouse, and A. Story. 2005. Riparian microclimate and stream temperature response to forest harvesting: A review. Journal of the American Water Resources Association 41(4):813-834.		
25.	Schindler *et al.* 2003	23	Schindler, D.E., M.D. Scheuerell, J.W. Moore, S.M. Gende, T.B. Francis, and W.J. Palena. 2003. Pacific salmon and the ecology of coastal ecosystems. Front. Ecol. Environ, 1:31– 37.	USFWS states: "The effects of reduced nutrient availability and biological production on naturally reproducing anadromous Pacific salmon populations are well known and extensively described in scientific literature (e.g. Schindler *et al.* 2003, Wipfli *et al.* 2003, Janetski *et al.* 2009)."	USFWS present no information or evidence of lack of nutrients in the lower Tuolumne River, nor any evidence of reduced "biological production". Greenberg (2009) published in the journal BMJ calls the use of citations to convert "hypothesis into fact through citation alone" as a form of "invention".
26.	Wipfli *et al.* 2003	23	Wipfli, M.S., J.P. Hudson, J.P. Caoette, and D.T. Chaloner. 2003. Marine subsidies in freshwater ecosystems: salmon carcasses increase the growth rates of stream-resident salmonids. Transactions of American Fisheries Society 132: 371–381.		
27.	USFWS 2005a	23	USFWS. 2005. Recommended streamflow schedules to meet the AFRP doubling goal in the San Joaquin River Basin. Anadromous Fish Restoration Program, U.S. Fish and Wildlife Service, Lodi, California. 31pp.	USFWS states: "The Lower Tuolumne River could support at least 38,000 fall-run Chinook salmon (USFWS 2005a)."	Study W&AR-04: Spawning Gravel in the Lower Tuolumne River concluded that under existing conditions there is sufficient spawning gravel between RM 52 and 24 to support a spawning population of fall-run Chinook of 50,000 to 60,000 adults at a flow of 225 cfs (TID/MID 2013b, W&AR-04).

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28.	NMFS 2014b	24	NMFS. 2014b. Recovery Plan for the Evolutionarily Significant Units of Sacramento River Winter-Run Chinook Salmon and Central Valley Spring-Run Chinook Salmon and the Distinct Population Segment of California Central Valley Steelhead. National Oceanic and Atmospheric Administration (NOAA) Fisheries. California Central Valley Area Office. July 2014.	USFWS states: "Core populations have a known ability or potential to support viable self-sustaining populations and have a moderate capacity to respond favorably to recovery actions (NMFS 2014b; Lindley et. al. 2007)."	The USFWS reference to the NMFS Recovery Plan is not accurate. Only Core 1 populations in the Recovery Plan are characterized as having a "known ability or potential to support" viable populations. Page iii of the NMFS Recovery Plan reads as follows: *"Watersheds that are currently occupied by at least one of the listed Chinook salmon and steelhead species have been prioritized among three levels. Of highest priority are core 1 populations, which have been identified, based on their known ability or potential to support independent viable populations. Core 1 populations form the foundation of the recovery strategy and must meet the population-level biological recovery criteria for low risk of extinction set out in Table 5-1. NMFS believes that core 1 populations should be the first focus of an overall recovery effort. Core 2 populations are assumed to have the potential to meet the moderate risk of extinction criteria set out in Table 5-1. These dependent populations are of secondary importance for recovery efforts."* The Tuolumne River is designated in the NMFS Recovery Plan as Core 2.
29.	Lindley et. al. 2007	24	Lindley, S.T., R.S. Schick, E. Mora, P.B. Adams, J.J. Anderson, S. Greene, C. Hanson, B.P. May, D.R. McEwan, R.B. MacFarlane, C. Swanson, J.G. Williams. 2007. Framework for assessing viability of threatened and endangered salmon and steelhead in the Sacramento- San Joaquin Basin. San Francisco Estuary and Watershed Science 5(1): article 4. Available: http://repositories.cdlib.org/jmie/sfews/vol5/iss1/art4		The citation to Lindley et al. (2007) is misplaced. Much of the paper deals with discussing the possible effects of climate change on salmon and steelhead populations in California. The Tuolumne River is mentioned just once in the entire article, and the reference to the Tuolumne is actually used as an example where even a modest climate warming of 2°C would likely result in the loss of any remaining salmon and steelhead habitat in the upper Tuolumne River. In fact, the paper goes on to warn that in a warmer future "some basins might cease to be suitable for salmon or steelhead" and further that "[i]t would be a costly mistake to invest heavily in restoring habitat that will become too warm to support salmonids." It is also worth noting that Lindley et al. (2007) appears to apply a temperature cutoff of 25°C (a temperature far greater than EPA 2003 temperatures) when evaluating habitat remaining available for Chinook and steelhead under climate warming scenarios. In Lindley et al (2006), an upper mean August air temperature limit of 24°C was applied when evaluating the "downstream boundaries of habitat patches." Lindley et al (2006) cited Mohseni and Erikson (1998) for support that "stream temperature is linearly related to air temperature between 0 and 24°C."
30.	Moyle 2002	25	Moyle, P.B. 2002. Salmon and Trout, Salmonidae - Chinook Salmon, (Oncorhynchus tshawytscha). In Inland Fishes of California. Los Angeles, California: University of California Press, 251-263.	USFWS states: "At higher water temperatures, such as those found in the lower Tuolumne River in most summers, steelhead trout are more vulnerable to stress and death (Moyle 2002)."	Moyle (2002) does not specifically analyze summer temperatures in the Tuolumne River as implied by the citation. Site-specific studies of Tuolumne River *O. mykiss* and temperature suitability were conducted during the ILP. The USFWS presents no evidence or information supporting its assertion that summer time water temperatures are adversely affecting the Tuolumne River *O. mykiss* population. Studies of the Tuolumne River *O. mykiss* population demonstrate that the population has expanded significantly since the implementation of the '95 Settlement Agreement (TID/MID 2013a, W&AR-05).
31.	Mesick *et al.* (2008)	41	[provided above]	USFWS states: "In looking at the Stanislaus River data, Mesick *et al.* (2008) found that when flows were high	As indicated previously, the back-up data and analysis supporting the Mesick et al. (2008) study have not been located and therefore, the study results are not reproducible.

No	Citation	Pg No.	Full Reference	Context of Citation	Analysis
32.	USFWS 2004[1]	41	USFWS. 2004. Endangered and threatened wildlife and plants: proposed designation of critical habitat for the California red-legged frog. Proposed Rule. Federal Register 69(71):19620– 19642. April 13.	between February and June the juvenile to smolt survival averaged 84%. The rotary screw traps in the Tuolumne River are not set up to measure juvenile to smolt survival, so the Stanislaus River must act as a surrogate in this regard (Attachment 1—USFWS 2004)."	This statement is in error. The Tuolumne River and Stanislaus River RST monitoring programs are both designed and operated in a similar fashion and provide equivalent data sets for their respective river. On both rivers traps are operated consistent to the 1997 USFWS Comprehensive Assessment and Monitoring Program (CAMP) Implementation Plan. The operation of paired RSTs, Waterford (RM 29.8) and Grayson (RM 5.3), on the Tuolumne River since 2006 has provided an annual index of juvenile Chinook survival. There is no reason why the Stanislaus RSTs would need to be used as a surrogate for the Tuolumne RSTs related to juvenile and smolt survival. Furthermore, the Tuolumne RST survival indices are readily available and have been provided in the FERC annual reports. As part of the ILP studies, the Districts conducted a detailed assessment of the Tuolumne River RST data to provide input to the W&AR-06 (TID/MID 2017a) fall-run Chinook population model. This analysis is included in the AFLA and is entitled "Analysis of Tuolumne River Rotary Screw Trap Data to examine the relationship between river flow and survival rates for Chinook smolts migrating between Waterford and Grayson (2006-12)" (Robichaud and English 2013).
33.	Zeug *et al.* 2014	41	Zeug, S.C., K. Sellheim, C. Watry, J.D. Wikert, J. Merz. 2014. Response of juvenile Chinook salmon to managed flow: Lessons learned from a population at the southern extent of their range in North America. Fisheries Management and Ecology 21:155-168.	USFWS states: "The results of Mesick *et al.* (2008) and Mesick and Marston (2007) are consistent with recent findings of increased juvenile salmonid survival as a result of increased flows (Zeug *et al.* 2014, Sturrock *et al.* 2015) and access to activated vegetated floodplain and riparian areas (Hayes *et al.* 2008, Jeffres *et al.* 2008, Limm and Marchetti 2009, Woodson *et al.* 2013)."	This sentence is a prime example of the misuse and mischaracterization of citations by USFWS in an attempt to use citations to turn a hypothesis into fact. While the Zeug et al. (2014) and Sturrock et al. (2015) are excellent papers, citing them to assert a connection between juvenile salmonid survival and access to "activated" floodplains is not a valid use. Zeug et al. (2014) did not distinguish juvenile salmonid survival with access to floodplains, nor did the study attempt to identify juveniles that used floodplains or juveniles that used in-channel habitats. Indeed, in 6 of the 12 years studied, from 40% to over 90% of outmigrants left as "pre-smolts". Fish outmigrating as fry or small juveniles may not have resided on the floodplain at all as they leave the system within a short time after emergence. In any event, Zeug et al. did not try to estimate the percent of fish that might have resided on the flooplain. For the Tuolumne River, the Districts also found a positive relationship between flows and increased survival, but found this relationship appears to be more flow-event driven than related to seasonal cumulative discharge. This relationship for the Tuolumne River is incorporated into the in-river fall-run Chinook population model (Robichaud and English 2013).

[1] USFWS's reference to USFWS 2004 appears to be in error. The District's consider the correct citation to be "USFWS. 2014. Identification of the instream flow requirements for Anadromous fish in the streams within the Central Valley of California and fisheries investigations - Annual progress report fiscal year 2014." This report was filed as Attachment 1 to the USFWS January 29th, 2018 comment letter to the Don Pedro AFLA.

No	Citation	Pg No.	Full Reference	Context of Citation	Analysis
34.	Sturrock *et al.* 2015	41	Sturrock, A.M., J.D. Wikert, T. Heyne, C. Mesick, A.E. Hubbard, and T.M. Hinkelman. 2015. Reconstructing the migratory behavior and long-term survivorship of juvenile Chinook salmon under contrasting hydrologic regimes. Plos One 10.		Sturrock et al. (2015) used otolith analysis of adult Chinook salmon returning to the Stanislaus River to reconstruct the sizes at which they outmigrated as juveniles in a wetter year (2000) and a drier year (2003). Using RST-derived estimates of outmigrant timing, Sturrock et al. (2015) estimated the contribution of migratory phenotypes (fry, parr, smolts) to the adult spawning population under different flow regimes. Contrary to the USFWS assertion, Sturrock et al. (2015) did not analyze juvenile survival vs. flow or juvenile survival vs use of floodplains. In fact, as far as Sturrock et al. (2015) examined any flow vs. survival relationship, it found the following: *"Although lower flows and warmer temperatures in the Stanislaus may have contributed to the lower outmigrant production observed in 2003, our results suggest that after exiting the natal river, there was no significant difference in juvenile survival. Survival rates were, if anything, marginally higher in 2003, contradicting many tagging studies which find reduced salmon survival through the freshwater delta during low flow conditions"* Sturrock et al. (2015) found that overall fry (<55 mm) outmigrants represented 50-85% of the outmigrants in the two years analyzed. Therefore, these fish, exiting the river relatively soon after emergence, would not have used floodplains for any extended period. Therefore, suggesting an increased juvenile survival due to either an increase flow or access to floodplains are unsupported by Sturrock et al. (2015). The Districts conducted an otolith study of Tuolumne River adults (see TID/MID 2016, W&AR-11) using a larger sample of water years than Sturrock et al. (2015). The results played an important role in informing the Districts Preferred Plan. In contrast to Sturrock et al. (2015) findings, juvenile fish that leave the Tuolumne River as fry make up less than 5% of the adult escapement.
35.	Hayes *et al.* 2008	41	[provided above]		Hayes et al. (2008) compared *O. mykiss* growth in a coastal lagoon to the upper watershed of the lagoon's coastal tributary (Scott Creek). The word "floodplain" does not occur in the article and there is no comparison of growth or survival of floodplain-reared fish vs. in-channel reared fish.
36.	Jeffres *et al.* 2008	41	[provided above]		Jeffres et al. (2008) actually found that juvenile Chinook in the riverine portion of the Cosumnes River grew at a similar rate than juveniles on the floodplain. See NMFS section of this table below (row No. 114) for a detailed explanation of Jeffres et al. 2008).
37.	Limm and Marchetti 2009	41	[provided above]		Contrary to USFWS assertion, Limm and Marchetti (2009) did not attempt to estimate survival rates associated with use of different habitats (floodplain vs. in-channel). See NMFS section of this table below (row No. 116) for further description of the study.
38.	Woodson *et al.* 2013	41	[provided above]		Citing to Woodson et al. (2013) is misplaced. See USFWS No. 10 above.

No	Citation	Pg No.	Full Reference	Context of Citation	Analysis
39.	USFWS 1987	41-42	USFWS. 1987. Exhibit 31: the needs of chinook salmon, Oncorhynchus tshawystcha in the Sacramento-San Joaquin Estuary. Presented to the State Water Resources Control Board for the 1987 Water Quality/Water Rights Proceedings on the San Francisco Bay/Sacramento-San Joaquin Delta.	USFWS states: "The importance of high spring flows during outmigration on smolt survival has been shown for the Tuolumne River (USFWS 1987; Kope and Botsford 1990; USFWS 1992; EA Engineering 1997; CDFG 1998)."	Referring to studies dating back to 1987, 1990, 1997, and 1998, some of which do not even use any Tuolumne River-specific smolt survival data, while ignoring the detailed analysis of recent RST results (see Robichaud and English 2013) from the two RSTs on the Tuolumne River, serves no useful purpose. The ILP studies provide the best available information to inform effective actions and measures to improve in-river survival.
40.	Kope and Botsford 1990	41-42	Kope, R. G. and L. W. Botsford. Determination of factors affecting recruitment of chinook salmon Oncorhynchus tshawytscha in central California. Fishery Bulletin 88: 257-269.		
41.	USFWS 1992	41-42	USFWS. 1992. Measures to improve the protection San Joaquin fall-run chinook salmon in the Sacramento/San Joaquin River delta. Presented to the State Water Resources Control Board for the 1992 Water Quality/Water Rights Proceedings on the San Francisco Bay/Sacramento-San Joaquin Delta.		
42.	EA Engineering 1997	41-42	EA. 1997. 1996 FERC Report: Stock recruitment analysis report. Supplement to 1992 FERC Report Appendix 2. Lafayette, CA. 23 pp.		
43.	CDFG 1998	41-42	California Department of Fish and Game (CDFG). 1998. Rotary screw trap capture of chinook salmon smolts with survival and production indices for the Tuolumne River in 1997. Fresno, CA.		
44.	Hayes *et al.* 2008	42	[provided above]	USFWS states: "The claim made that rearing habitat is not limiting for juvenile salmon in the lower Tuolumne River is inconsistent with contemporary science on juvenile salmonid rearing habitat (Hayes *et al.* 2008, Jeffres *et al.* 2008 Limm and Marchetti 2009, NMFS 2014b, Opperman 2012, Opperman *et al.* 2010, Sommer *et al.* 2001)."	None of the cited "contemporary science" has anything to do with the Tuolumne River. Indeed, as discussed above, USFWS has mischaracterized many of these citations. The ILP W&AR-06 Fall-run Chinook Population Model, using various Tuolumne River-specific data found rearing habitat to not be limited (TID/MID 2017a).
45.	Jeffres *et al.* 2008	42	[provided above]		
46.	Limm and Marchetti 2009	42	[provided above]		
47.	NMFS 2014b	42	[provided above]		
48.	Opperman 2012	42	Opperman, J. 2012. A conceptual model for floodplains in the Sacramento-San Joaquin Delta.San Francisco Estuary & Watershed Science 10(3). Available: http://escholarship.org/uc/item/2kj52593		

No	Citation	Pg No.	Full Reference	Context of Citation	Analysis
49.	Sommer *et al.* 2001	42	Sommer, T.R., M.L. Nobriga, W.C. Harrell, W. Batham, and W.J. Kimmerer. 2001. Floodplain rearing of juvenile Chinook salmon: Evidence of enhanced growth and survival. Canadian Journal of Fisheries and Aquatic Sciences 58(2):325-333.		Sommer et al. (2001) is an excellent study of fall-run Chinook use of the Yolo Bypass on the Sacramento River. The 60,000 acre Yolo Bypass has little to no comparability to the 600 acre Tuolumne River floodplain, and USFWS makes no attempt at such a comparison. Sommer et al. (2001) presents the results of a thorough evaluation of juvenile salmon use of the Yolo Bypass, including examination of salmon diets and prey availability. No such studies of food sources on the Tuolumne River are cited by USFWS and none are known to exist. More importantly, and contrary to the USFWS general assertion relating to increased survival resulting from floodplain rearing (vs. in-channel rearing), Sommer et al. (2001) states: *"Bioenergetic modeling suggested that feeding success was greater in the floodplain than in the river, despite increased metabolic costs of rearing in the significantly warmer floodplain. Survival indices for coded-wire-tagged groups were somewhat higher for those releasedin the floodplain than for those released in the river,* ***but the differences were not statistically significant."*** (emphasis added)
50.	Sturrock *et al.* 2015	43	[provided above]	USFWS states: "This is likely to result in juvenile fish leaving the system at small sizes that reduce their chances of surviving outmigration, as indicated by studies looking at otoliths from fish collected from within the Central Valley tributaries (Sturrock and Johnson 2013, Sturrock *et al.* 2015)."	Here, USFWS raises a concern that juvenile salmonids leaving the Tuolumne River at small sizes have reduced chances of survival. The Districts share this concern. Yet, it is the USFWS that proposes flows in February and March (50% of unimpaired flow) that will induce the very effect of downstream displacement of fry. The period from February to mid-March are associated with fry rearing. USFWS recommended flows will tend to produce the adverse effects it claims as being important to avoid. The Districts pulse flows, as explained in the AFLA, are specifically intended to be timed with smoltification, when juveniles are motivated to leave the system. In any event, Sturrock et al. (2015) argues that fry leaving the Stanislaus River make an important contribution to the later adult escapement (10-23%). In contrast to Sturrock et al. (2015) findings, juvenile fish that leave the Tuolumne River as fry make up less than 5% of the adult escapement (see TID/MID 2016, W&AR-11).
51.	USFWS 2014	51	USFWS. 2014. Identification of the instream flow requirements for Anadromous fish in the streams within the Central Valley of California and fisheries investigations - Annual progress report fiscal year 2014.	USFWS states: "Research on the Tuolumne River (USFWS 2014) has shown a significant correlation between floodplain activation and in-river survival of juvenile salmonids."	There are numerous problems with the technical basis of this analysis. The Districts are providing comments on this analysis in a separate section of this May 14 filing (see Section 7.0)
52.	Hutchins and Charles 2016	63	Hutchins, T., and C. Charles. 2016. Tuolumne River Fish Migration & Spawning Above Don Pedro Reservoir. Unpublished data in USFWS files. 18pp.	USFWS states: "The reproductively-viable Chinook salmon that were stocked in Don Pedro Reservoir, prior to 2013, have established an adfluvial population that spawns in the upper Tuolumne River watershed (Hutchins and Charles 2016)."	Citing to unpublished data requires the data to be provided in the filing with FERC. USFWS has not done this. This data needs to be made available with adequate time to review and comment.

No	Citation	Pg No.	Full Reference	Context of Citation	Analysis
USFWS ATTACHMENT 5: USE OF CUMULATIVE ACRE-DAYS TO EVALUATE CHANGES IN FLOODPLAIN INUNDATION ON THE LOWER TUOLUMNE RIVER UNDER DIFFERENT HYDROLOGICAL REGIMES AND QUANTIFICATION OF MITIGATION MEASURES					
60.	Jeffres et al 2008	Att. 5 p. 1	Jeffres CA, Opperman JJ, Moyle PB. 2008. Ephemeral floodplain habitats provide best growth conditions for juvenile chinook salmon in a california river. Environmental Biology of Fishes 83:449-458.	USFWS states: "The importance of floodplain habitats as rearing habitat for juvenile salmonids has been well documented (e.g Jeffres et al 2008, Sellheim et al 2016, and Bellmore et al 2013)."	The USFWS in Attachment 5 purport to show a relationship between acre-days of floodplain inundation and juvenile survival on the Tuolumne River. To the extent that USFWS attributes the asserted increased survival to increased growth resulting from floodplain access, Jeffres et al. (2008) does not support this because Jeffres et al. (2008) reported similar rates of growth between juveniles on the floodplain and in the river channel upstream of the floodplain. Furthermore, Jeffres et al. (2008) did not examine the potential relationship between floodplain use and survival during outmigration.
61.	Sellheim et al 2016	Att. 5 p. 1	Sellheim KL, Watry CB, Rook B, Zeug SC, Hannon J, Zimmerman J, et al. 2016. Juvenile salmonid utilization of floodplain rearing habitat after gravel augmentation in a regulated river. River Research and Applications 32:610-621.		Sellheim et al. (2015) could actually be cited as arguing against the USFWS recommended flows. Sellheim et al (2015) cautions that releasing high flows when fry are in the river creates conditions where fry can be swept downstream to the Sacramento River and Bay-Delta and there be subject to low survival. USFWS flow recommendation of 50% unimpaired flow in February and March are likely to result in displacement of fry out of the Tuolumne River or to the lower river sections where predation is higher (USFWS expresses the same concern itself on page 43 of the January 29, 2018 comments). The Districts Otolith Study (TID/MID 2016, W&AR-11) confirms this concern.
62.	Bellmore et al 2013	Att. 5 p. 1	Bellmore JR, Baxter CV, Martens K, Connolly PJ. 2013. The floodplain food web mosaic: A study of its importance to salmon and steelhead with implications for their recovery. Ecological Applications 23:189-207.		Bellmore et al. (2013) presents the results of a detailed study of food web structures for rearing salmon and steelhead in the Methow River in Washington State. Bellmore et al. (2013) points out the heterogeneity of floodplains and sloughs and emphasizes the need for location-specific, quantitative data on the floodplain food webs to inform natural resource management. USFWS presents no information or data equivalent to that used in Bellmore et al. (2013).
63	Zeug et al 2014	Att. 5 p. 1	Zeug SC, Sellheim K, Watry C, Wikert JD, Merz J. 2014. Response of juvenile Chinook salmon to managed flow: Lessons learned from a population at the southern extent of their range in North America. Fisheries Management and Ecology 21:155-168.	USFWS states: "Positive correlations have also been shown between juvenile salmon survival and increased river flows (e.g. Zeug et al 2014 and Sturrock et al 2015)."	Zeug et al. (2014) did show increased survival with flow, but did not show any relationship between increased survival and use of floodplains. Zeug et al. (2014) made no attempt to distinguish between juveniles that used floodplains or juveniles that used in-channel habitats. Indeed, in 6 of the 12 years studied, from 40% to over 90% of outmigrants left as "pre-smolts". Fish outmigrating as fry or small juveniles may not have resided on the floodplain at all as they leave the system within a short time after emergence.
64.	Sturrock et al 2015	Att. 5 p. 1	Sturrock AM, Wikert JD, Heyne T, Mesick C, Hubbard AE, Hinkelman TM, et al. 2015. Reconstructing the migratory behavior and long-term survivorship of juvenile chinook salmon under contrasting hydrologic regimes. Plos One 10.		Sturrock et al. (2015) did not develop a relationship between juvenile salmon survival and flow on the Stanislaus River for the two years of outmigrant data. Sturrock et al. (2015) does state the following: *"Although lower flows and warmer temperatures in the Stanislaus may have contributed to the lower outmigrant production observed in 2003, our results suggest that after exiting the natal river, there was no significant difference in juvenile survival. Survival rates were, if anything, marginally higher in 2003, contradicting many tagging studies which find reduced salmon survival through the freshwater delta during low flow conditions"*

No	Citation	Pg No.	Full Reference	Context of Citation	Analysis
65.	McBain & Trush 2000	Att. 5 p. 1	McBain and Trush. 2000. Habitat Restoration Plan for the Lower Tuolumne River Corridor. Prepared for Tuolumne River Technical Advisory Committee. 240pp.	USFWS states: “The Project has reduced the estimated average annual flood (based on annual maximum series) from 18,400 cfs to 6,400 cfs and reduced the 1.5-year recurrence event from 8,400 cfs to 2,600 cfs (McBain & Trush 2000). The 50% exceedence flow for the Tuolumne River (i.e., the median annual flow, or the flow that was exceeded 50% of the days), has been reduced from 1,064 cfs to 224 cfs by the Project (McBain & Trush 2000).”	Reduction of flood flows is a Project purpose, as the ACOE purchased flood storage space in the Don Pedro Reservoir for the protection of downstream lives and property. The USFWS simply points out that the Project was successful in meeting this purpose.
66.	Sommer et al. 2001	Att. 5 p. 1	Sommer, T., D. McEwan, and G. H. Burgess. 2001. Factors Affecting Chinook Salmon Spawning in the Lower Feather River in Contributions to the biology of Central Valley salmonids. R.L.Brown. (ed.), CDFG, 269-297.	USFWS states: “The Project’s flow reductions result in a decrease of floodplain habitat inundated during biologically important time periods, such as spring, making less habitat available for juvenile salmonids rearing on the lower Tuolumne River. This is important because floodplain habitat is essential rearing habitat for juvenile salmonids and has been found to significantly increase food availability and condition factor in salmonids (Sommer et al. 2001; Limm and Marchetti 2009).”	The USFWS does not present any information or data related to salmonid rearing habitat on the Tuolumne River, and completely ignores the Districts detailed instream and floodplain habitat studies. Nor does USFWS present any information or data on Tuolumne River floodplain food sources. USFWS makes its recommendations in the absence of any habitat or food data. Sommer at al. (2001) studied growth of Chinook juveniles using the Yolo Bypass for rearing compared to those using the Sacramento River for rearing. Sommer et al. (2001) reported the following: *“We found that the Yolo Bypass floodplain had significantly higher water temperatures and that young salmon from the floodplain ate significantly more prey than those from the Sacramento River. “* Studies conducted by the Districts do not show a significant temperature difference between the river and floodplain, including data collected in 2017 and included in this submittal.
67.	Limm and Marchetti 2009	Att. 5 p. 1	Limm MP, Marchetti MP. 2009. Juvenile chinook salmon (*Oncorhynchus tshawytscha*) growth in off-channel and main-channel habitats on the sacramento river, ca using otolith increment widths. Environmental Biology of Fishes 85:141-151.		The words “condition factor” do not appear in Limm and Marchetti (2009), USFWS presents no information or data demonstrating food availability on Tuolumne River floodplains.
68.	USFWS 2014	Att. 5 p. 2	U.S. Fish and Wildlife Service (USFWS). 2014. Identification of the instream flow requirements for Anadromous fish in the streams within the Central Valley of California and fisheries investigations - Annual progress report fiscal year 2014.	USFWS states: “A cumulative acre-day analysis was used to quantify floodplain inundation because it integrates floodplain inundation over time and space, ensuring that that the full range of inundation, including shorter flow pulses (high flows for a short period of time) and longer inundation periods (often lower flows but for longer durations), are included. When a cumulative acre-day analysis was conducted for the Stanislaus River (USFWS 2014), a positive relationship was shown between acre-days inundated and juvenile salmon survivorship (Figure 1).”	It is apparent that USFWS has placed great weight on the “acre-day” inundation vs. survival relationship developed in Attachment 5. The Districts are providing two independent reviews on USFWS Attachment 5 in this May 14 submittal, both of which point out serious flaws with the USFWS analysis.

No	Citation	Pg No.	Full Reference	Context of Citation	Analysis
69..	USFWS 2015	Att. 5 p. 2	U.S. Fish and Wildlife Service (USFWS). 2015. Letter from USFWS to Federal Energy Regulatory Commission U.S. Fish and Wildlife Service Comments on W&AR-21 Lower Tuolumne River Floodplain Hydraulic Assessment Draft Report; Don Pedro Hydroelectric Project, FERC Project # P-2299; Tuolumne and Stanislaus Counties, California dated October 1 2015.	USFWS states: "In addition, when the FWS conducted a cumulative acre-day analysis for the Tuolumne River (USFWS 2015), a positive relationship was also shown between acre-days inundated and juvenile salmon survivorship (Figure 2)."	See review of comment 68 above.
70..	Stillwater Sciences 2013	Att. 5 p. 3	Stillwater Sciences. 2013. Salmonid population information integration and synthesis study report Don Pedro Project P-2299 (W&AR-05) Prepared for Modesto Irrigation District and Turlock Irrigation District. 200pp.	USFWS states: "The period of February 1 through June 15 was used to calculate inundated acres and was chosen from within a broader period of life stage periodicity for Chinook salmon (Stillwater Sciences 2013)."	The cite to Stillwater Sciences (2013), if specifically intended to support use of the February 1 through June 15 period for the USFWS analysis, is misplaced. The best available information on juvenile fall-run Chinook outmigration is contained in W&AR-06 (TID/MID 2017a) and includes the detailed evaluation of survival on the Tuolumne River using the Tuolumne RSTs (Robichaud and English 2013). A large portion of the juveniles (fry-stage) leave the river from mid-January through February and do not use the floodplains at all. Attributing their survival to floodplain use via the "acre-days of inundation" from Feb 1 to June 15 is misplaced.
71.	Sommer *et al.* 2001	Att. 5 p. 3	[provided above]	USFWS states: "This time period has been shown to be important for juvenile salmonid rearing (Moyle 2002; Sommer *et al.* 2001; Sturrock *et al.*, 2015; Yoshiyama *et al.* 1998; Zeug *et al.*, 2014)."	None of these citations are relevant to the Tuolumne River. There are years of data available specific to the Tuolumne River covering fall-run Chinook outmigration.
73.	Sturrock *et al.*, 2015	Att. 5 p. 3	[provided above]		
73.	Yoshiyama *et al.* 1998	Att. 5 p. 3	Yoshiyama, R., F. Fisher, and P. B. Moyle. 1998. Historical Abundance and Decline of Chinook Salmon in the Central Valley Region of California. North American Journal of Fisheries Management 18:487-521.		
74.	Zeug *et al.*, 2014	Att. 5 p. 3	Zeug SC, Sellheim K, Watry C, Wikert JD, Merz J. 2014. Response of juvenile Chinook salmon to managed flow: Lessons learned from a population at the southern extent of their range in North America. Fisheries Management and Ecology 21:155-168.		
75.	Stillwater Sciences 2013	Att. 5 p. 4	[provided above]	USFWS states: "Seining surveys and rotary screw trap data for Chinook salmon in the lower Tuolumne River confirm the importance of this time period (Stillwater Sciences 2013)."	This citation is addressed in the two separate reviews conducted of the USFWS Attachment 5 included herein in Section 7.0, and Attachments T and U.

No	Citation	Pg No.	Full Reference	Context of Citation	Analysis
76.	Jeffres et al. 2008	Att. 5 p. 8	[provided above]	USFWS states: "The increased flows from the USFWS flow proposal should result in nine additional years of juvenile Chinook salmon experiencing higher rates of survival than DPP-1 flows. By increasing floodplain habitat quality on 520 acres that inundate at elevations of <5,500 cfs, more restored habitat will be located at elevations where fish can achieve higher productivity rates than the main channel (Jeffres et al. 2008; Limm and Marchetti, 2009; Sommer et al. 2001)."	It is not clear what USFWS means by "productivity rate". If this is intended as a measure of in-river production of fall-run Chinook salmon, Jeffres et al. (2008) did not measure or present results for production. Jeffres et al. (2008) reported on growth and found growth of juvenile fall-run Chinook in enclosures in the river channel grew at rates similar to fish in enclosures on the floodplain. USFWS presents no information or date to support differential production for the main channel of the Tuolumne and Tuolumne floodplains. One of the ILP- developed fish population models for the Tuolumne River evaluated in-river production of fall-run Chinook. USFWS did not use this model to estimate the effect of its proposed floodplain modifications.
77.	Limm and Marchetti, 2009	Att. 5 p. 8	[provided above]		Limm and Marchetti (2009) examined otoliths of juvenile Chinook to determine differential growth rates resulting from different habitats. "Floodplain" use was based on using off-channel ponds, not typical floodplain habitat found on the Tuolumne. Nor did Limm and Marchetti (2009) estimate production or survival rates due to use of different habitats. .
78.	Sommer et al. 2001	Att. 5 p. 8	[provided above]		Sommer et al. (2001) conducted a detailed study of differential growth between juvenile use of the Yolo Bypass floodplain and the channel of the Sacramento River. Sommer et al. (2001) concluded that higher growth of juveniles on the Yolo Bypass was due to the significantly higher temperatures on the floodplain compared to in-river and an abundance of prey. Studies of temperature differences on the Tuolumne floodplains compared to in-river, including a study recently conducted in 2017 and included in this May 14, 2018, submittal to FERC, to not show a significant difference and no studies comparing in-river prey availability compared to floodplain have been undertaken on the Tuolumne.
79.	NOAA 2014	Att. 5 p. 8	National Oceanic and Atmospheric Administration (NOAA) Fisheries. 2014. Recovery Plan for the Evolutionarily Significant Units of Sacramento River Winter-Run Chinook Salmon and Central Valley Spring-Run Chinook Salmon and the Distinct Population Segment of California Central Valley Steelhead. California Central Valley Area Office. July 2014.	USFWS states: "The USFWS flow proposal in conjunction with habitat restoration is designed to result in a suite of positive effects necessary for increased juvenile salmonid rearing opportunities, such as increases to macroinvertebrate productivity, cover and foraging habitat, shade, large woody debris inputs, and geomorphic heterogeneity (NOAA 2014; Sellheim et al., 2016; Sturrock et al., 2015)."	NOAA (2014) presents no information or data relevant to juvenile rearing opportunities, increases in macroinvertebrate productivity, foraging habitat, LWD inputs or geomorphic heterogeneity.
80.	Sellheim et al., 2016	Att. 5 p. 8	[provided above]		Sellheim et al. (2015) could actually be cited as arguing against the USFWS recommended flows. Sellheim et al (2015) cautions that releasing high flows when fry are in the river creates conditions where fry can be swept downstream to the Sacramento River and Bay-Delta and there be subject to low survival. USFWS' flow recommendation of 50% unimpaired flow in February and March are likely to result in displacement of fry out of the Tuolumne River or to the lower river sections where predation is higher (USFWS expresses the same concern itself on page 43 of the January 29, 2018 comments). The Districts ILP study of Tuolumne River adult otoliths (TID/MID 2016, W&AR-11) confirms this concern as Chinook leaving the river as fry make up a very small (<5%) percent of the adult escapement.

No	Citation	Pg No.	Full Reference	Context of Citation	Analysis
81.	Sturrock et al., 2015	Att. 5 p. 8	[provided above]		Sturrock et al. (2015) presents no information or data relevant to juvenile rearing opportunities on the Tuolumne River, increases in macroinvertebrate productivity, foraging habitat, LWD inputs or geomorphic heterogeneity. However, it is worth noting that this statement by USFWS is inconsistent with its statement on page 43 where USFWS uses Sturrock et al. (2015) to make the opposite point. USFWS states on page 43 that the Districts' proposed pulse flows occurring during fry stage are "likely to result in juvenile fish leaving the system at small sizes that reduce their chances of surviving outmigration, as indicated by studies looking at otoliths from fish collected from within the Central Valley tributaries (Sturrock and Johnson 2013, Sturrock *et al.* 2015)." In Attachment 5, the USFWS cites to Sturrock et al. (2005) as supporting the USFWS flow proposal. The fact is that the Districts' proposed flows specifically do not include pulse flows during the fry rearing life stage for exactly the reason USFWS identifies on page 43 of its filing. It is the USFWS that is proposing high February and March flows which are likely to cause the very impact the USFWS is seeking to avoid on page 43.

No	Citation	Pg No.	Full Reference	Context of Citation	Analysis
NMFS JANUARY 29TH COMMENT LETTER IN RESPONSE TO THE FERC REA NOTICES					
82.	NMFS 2014d	3	NMFS. 2014d. "*Final Recovery Plan for Sacramento River Winter-run Chinook Salmon, Central Valley Spring-run Chinook Salmon, and Central Valley Steelhead*." NMFS, West Coast Region, Sacramento, California. July 22, 2014.	NMFS states "The lower Tuolumne River has been designated in NMFS (2014d) Recovery Plan as a Core 2 population area for CCV steelhead. Core 2 population areas form part of the recovery strategy by contributing to the highest potential to support geographically diverse populations (NMFS 2014d). Core 2 populations still have a known ability or potential to support viable self-sustaining populations and have a moderate capacity to respond favorably to recovery actions (NMFS 2014d; Lindley *et. al*. 2007). The NMFS (2014d) Recovery Plan's conceptual scenarios for the Tuolumne River includes the enhancement of populations below La Grange Dam and the establishment of a viable population upstream of the Projects (Lindley *et. al*. 2007)."	Page iii of NMFS 2014d states: "Watersheds that are currently occupied by at least one of the listed Chinook salmon and steelhead species have been prioritized among three levels. Of highest priority are core 1 populations, which have been identified, based on their known ability or potential to support independent viable populations. Core 1 populations form the foundation of the recovery strategy and must meet the population-level biological recovery criteria for low risk of extinction set out in Table 5-1. NMFS believes that core 1 populations should be the first focus of an overall recovery effort. Core 2 populations are assumed to have the potential to meet the moderate risk of extinction criteria set out in Table 5-1. These dependent populations are of secondary importance for recovery efforts." Therefore, NMFS citation is in error. It is Core 1 populations which have been identified based on their "known ability or potential to support" viable populations. Additionally, nowhere in NMFS 2014d are Core 2 populations characterized as having "the highest potential to support geographically diverse populations". The term "highest potential" cannot be found in NMFS 2014d. Regarding NMFS' reference to "conceptual scenarios for the Tuolumne River" as being the establishment of a viable population upstream of the Project, no such phrase or reference is found in NMFS 2014d. In the NMFS Recovery Plan currently "unoccupied habitats" (e.g., the upper Tuolumne) that are thought to have historically supported spring-run Chinook salmon or steelhead are prioritized regarding fish reintroductions. These unoccupied habitats are prioritized as primary areas, candidates, or have been ruled out as places to reintroduce one or more of the species. "Primary" areas for reintroductions are areas where there is a known high likelihood of success based on species-specific life history needs, and available habitat quality and quantity. "Candidate" areas for reintroduction are unoccupied habitats that require further study of their potential for successful reintroductions before any "conceptual scenarios" for achieving reintroduction are considered. The upper Tuolumne River is listed in NMFS 2014d as a "candidate" stream.
83.	Lindley *et. al*. 2007	3	Lindley, S.T., R.S. Schick, E. Mora, P.B. Adams, J.J. Anderson, S. Greene, C. Hanson, B.P. May, D.R. McEwan, R.B. MacFarlane, C. Swanson, and J.G. Williams. 2007. Framework for assessing viability of threatened and endangered salmon and steelhead in the Sacramento- San Joaquin Basin. *San Francisco Estuary and Watershed Science* Volume 5, Issue 1 [February 2007], article 4.		The citation to Lindley et al (2007) is misplaced, if not contradictory to NMFS argument. A large part of the paper deals with discussing the possible effects of climate change on salmon and steelhead populations in California. The Tuolumne River is mentioned just once in the entire article, and the reference to the Tuolumne is actually used as an example where even a modest climate warming of 2°C would likely result in the loss of any remaining salmon and steelhead habitat presumed to be in the upper Tuolumne River. In fact, the paper goes on to warn that in a warmer future "some basins might cease to be suitable for salmon or steelhead" and further that "[i]t would be a costly mistake to invest heavily in restoring habitat that will become too warm to support salmonids." It is also worth noting that Lindley et al (2007) applied a temperature cutoff of 25°C when evaluating habitat remaining available for Chinook and steelhead under climate warming scenarios. In Lindley et al (2006), an upper mean August air temperature limit of 24°C was applied when evaluating the "downstream boundaries of habitat patches." Lindley et al (2006) cited Mohseni and Erikson (1998) for support that "stream temperature is linearly related to air temperature between 0 and 24°C."

No	Citation	Pg No.	Full Reference	Context of Citation	Analysis
84.	SWFSC 2018	3	SWFSC. 2018. "*On the Capacity of Upper Tuolumne and Merced Rivers for Reintroduction of Steelhead and Spring-run Chinook Salmon.*" For NMFS, Sacramento, CA, by David A. Boughton, Sara John, Carl J. Legleiter, Ryan Richardson, and Lee R. Harrison, NMFS, SWFSC, Santa Cruz, CA. January 19, 2018.	NMFS states "NMFS Southwest Fisheries Science Center's (SWFSC 2018) habitat capacity study and SWFSC (2017) upper Tuolumne River watershed *O. mykiss* genetics study show that the ancestral stock of CCV steelhead still exists above the Projects, with a smaller stock downstream of La Grange Dam, and that the upper Tuolumne River also has potential capacity to support a likely viable population of CCV steelhead."	The Districts' reply comments point out that SWFSC (2018) lacks sufficient information and data to allow a comprehensive technical review. The Districts' critique of this study was provided in the March 15, 2018 filing with FERC and the needed information has been requested from NMFS.
85.	SWFSC 2017	3	NMFS Southwest Fisheries Science Center (SWFSC). 2017. "*Genetic Analysis of Oncorhynchus mykiss in the Upper Tuolumne and Merced Rivers to Evaluate Ancestry and Adaptive Genetic Variation, Final Report*," for NMFS, Sacramento, CA, by Devon E. Pearse and Matthew A. Campbell, NMFS, SWFSC, Fisheries Ecology Division, Santa Cruz, CA. November 9, 2017.		Regarding the statement in SWFSC (2017) that a "smaller (ancestral) stock" of CCV steelhead exists downstream of La Grange Dam than upstream of Don Pedro, the report provides insufficient data to make the comparison between upper and lower river stocks. The Districts' data demonstrate that the Omy5 genetic code is at least as abundant, if not more abundant, in the *O. mykiss* population in the lower Tuolumne River. Therefore, there is no reason to connect the upper river stock with the lower river stock until the reasons for failure of the lower river stock to produce a steelhead population in the lower Tuolumne River is more clearly understood.
86.	Anchor 2017	4, 6, 8, 11	Anchor QEA (Anchor). 2017. "*Conceptual Engineering Plans for Fish Passage at La Grange and Don Pedro Dams on the Tuolumne River*." For NMFS, Sacramento, CA, by Anchor QEA, LLC, Seattle, WA. October 2017.	NMFS states: "Finally, a fish passage report from Anchor (2017) notes that fish passage of CCV steelhead into the upper Tuolumne River is feasible.", and "Further, a fish passage feasibility study prepared by Anchor (2017) concludes that passage of CV spring-run Chinook salmon into the upper Tuolumne River is feasible."	These statements are ambiguous, if not misleading. A strict reading must be interpreted as meaning that the Anchor Report found upstream passage of fish *into* the upper river to be feasible, leading the question of downstream passage unaddressed. A less precise reading could be interpreted to mean fish introduction to the upper river is "feasible", implying both upstream and downstream passage was found to be "feasible". In any event, it does not matter because the Anchor Report has numerous and significant errors and omissions and fails to qualify as either a "feasibility" level, or even a "conceptual" level engineering study. The Districts' critique of this study was provided in the March 15, 2018 filing with FERC.
87.	SWFSC 2018	4	[provided above]	NMFS states: "In addition, a SWFSC (2018) habitat capacity study indicates the upper Tuolumne River has ample capacity to support a viable population of CV spring-run Chinook salmon."	Determinations of the capacity of instream habitat must consider and evaluate the hydrologic and hydraulic regime of the water body. Habitat suitability is dependent on the flow regime of the river. The upper Tuolumne River flow regime is dominated by the hydroelectric peaking operations of the CCSF Holm powerhouse. The SWFSC (2018) report did not consider the effects of the Holm powerhouse peaking operation on habitat. Assessing habitat viability without taking into account the actual flow regime of the system is a serious omission and this alone calls into question any conclusion reached about habitat capacity.
88.	FERC 1995	4	FERC. 1995. "*Potential Cumulative Effects of Hydropower Projects in the Bay-Delta, California*." A Summary Report prepared by the Oak Ridge National Laboratory by Sale *et. al*., 1995, for Contract No. DE-AC05-84OR21400. FERC, Washington, D.C. October, 1995.	NMFS states: "NA green sturgeon are currently present in the Delta, but were extirpated from the San Joaquin River and its tributaries in the past in part due to altered flow regimes resulting from agricultural and FERC hydropower water diversions upstream of the Delta (FERC 1995). These altered flows may have affected sturgeon behavior, fecundity, abundance, and distribution."	This eight page paper prepared by Oak Ridge National Lab for FERC in 1995 was intended to identify the *potential scope* of cumulative impact analyses for FERC-licensed projects during FERC proceedings. The report did not conduct any actual analysis of any individual projects' cumulative impacts on any fish species, nor did it make any findings or conclusions about the Don Pedro Project, or any other project. Green sturgeon are mentioned a total of twice, once with reference to the fact that NMFS' 1995 draft Recovery Plan mentions that species, and once when it refers to the fact that the CVPIA mentions the species. To suggest, as NMFS' use of the citation does, that FERC 1995 concluded that green sturgeon were extirpated from the SJR basin "due to altered flow regimes resulting from … FERC hydropower water diversions" is misleading, to say the least.

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89.	USFWS 2013	4	No reference provided Possibly: USFWS. 2014. Identification of the Instream Flow Requirements for Anadromous fish in theStreams within the Central Valley of California and Fisheries Investigations - Annual Progress Report Fiscal year 2014. USFWS, Sacramento, CA.	NMFS states: "Furthermore, NMFS notes that the U.S. Fish and Wildlife Service has documented white sturgeon spawning in the lower San Joaquin River in all water year types (USFWS 2013). Thus, with improvements to flow and habitat in both the lower San Joaquin and Tuolumne rivers, NA green sturgeon may potentially recolonize the Tuolumne River in the foreseeable future."	There is no reference to "USFWS 2013" in the list of literature; therefore, review of this reference was not possible. In any event, to go from documented spawning of white sturgeon in the SJR to then conclude that improved flow in the Tuolumne will "thus" lead to the potential for green sturgeon to "recolonize the Tuolumne River in the foreseeable future" seems to lack scientific rigor.
90.	Yoshiyama *et al*. 2001	6	Yoshiyama, R.M., E.R. Gerstung, F.W. Fisher, and P.B. Moyle. 2001. Historical and Present Distribution of Chinook Salmon in the Central Valley Drainage of California *in* Contributions to the Biology of Central Valley Salmonids. Vol. 1. California Department of Fish and Game, Fish Bulletin 179, R.L. Brown, ed.	NMFS states: "Due primarily to the construction of dams, other barriers, and the dewatering of stream reaches, an estimated 1,057 miles (or 48%) of the stream lengths historically available to anadromous salmonids have been lost from the original total of 2,183 miles in the Central Valley; if only spawning and holding habitat (excluding migration corridors in the lower elevations) are considered, the reduction in historical range probably exceeds 72% because most of the former spawning and holding habitat was located in upstream reaches now inaccessible to anadromous salmonids (Yoshiyama *et al*. 2001)."	Generalized studies of anadromous fish habitat and populations in the Tuolumne River before European development (e.g., Yoshiyama et al 2001; Lindley et al 2006) have been superseded by site-specific studies conducted as part of the La Grange licensing and Don Pedro relicensing proceeding (TID/MID 2017e; Jayasundara et al. 2017). Furthermore, general statements as made by NMFS about estimates of lost habitat in the Central Valley due to "dams, other barriers, and dewatering" do not apply to the Tuolumne River. Site-specific field studies conducted during the La Grange licensing proceeding demonstrated that *physical* complete barriers to fish passage exist on the main stem Tuolumne (Preston Falls elev 2,700 ft) and all the primary tributaries to the main stem below Preston Falls (Cherry Creek @ RM 1.6, elev 2,360 ft; South Fork Tuolumne River @ RM 1.90, elev 2,085 ft; Clavey River @ (RM 2.05 elev 1,540 ft; and North Fork Tuolumne River @ RM 1.69, elev 1,165 ft). A partial barrier also occurs at Lumsden Falls on the main stem at RM 97 (elev 1,550 ft). Therefore, only a short reach of the Tuolumne River was potentially available to anadromous fish. When oversummering temperature suitability is considered (see study), it is quite possible, even likely, that spring-run Chinook and steelhead could only use the Tuolumne River in very wet years, if at all, if EPA (2003) temperature guidance is applied.
91.	Moyle *et al*. 2008	6	Moyle, P.M., J.A. Israel, and S.E. Purdy. 2008. Salmon, steelhead, and trout in California. Status of an Emblematic Fauna. UC Davis Center for Watershed Sciences, Davis, CA. 316pp. http://www.caltrout.org/SOS-Californias-Native-Fish-Crisis-Final-Report.pdf	NMFS states: "Other estimates of habitat loss in the Central Valley are higher, ranging up to 95% (Moyle *et al*. 2008)."	See Districts' Response No. 90 above.
92.	SWFSC (2018)	6-7	[provided above]	NMFS states: "In addition, SWFSC (2018) notes that the upper Tuolumne River habitats have great capacity for both salmonid species."	See Districts' review provided in No. 87 above. At a minimum, any study proposing to evaluate habitat suitability with respect to carrying capacity that fails to consider the actual characteristics of the flow regime that occurs in the reach under study cannot reasonably conclude the existence of "great capacity for both salmonid species."
93.	SWFSC (2017)	7	[provided above]	NMFS states: Lastly, SWFSC (2017) notes that the ancestral genetics of CCV steelhead still exist in the upper and lower Tuolumne River from which a viable population of CCV steelhead may likely be established through fish passage.	An initial question that must be addressed before putting at risk the upper river stock is: if the lower river stock contains the genetic trait for anadromy to at least as great an extent as the upper river stock, why is there not a steelhead population on the lower river? Exposing the upper river ancestral stock to the risk factors to which the lower river stock are exposed may permanently harm the upper river ancestral stock.
94.	Zimmerman *et al*. 2008	8	Zimmerman, C.E., G.W. Edwards, and K. Perry. 2008. Maternal Origins and Migratory History of *Oncorhynchus mykiss* Captured in Rivers of the Central Valley. *Transactions of the American Fisheries Society 138:280-291, 2009.*	NMFS states: "NMFS understanding is FERC now accepts the presence of the CCV steelhead DPS in the lower Tuolumne River. FERC's (2009) *Order On Rehearing, Amending License, Denying Late Intervention, Denying Petition, and Directing Appointment of a Presiding Judge for a Proceeding on Interim Conditions* (Rehearing Order) 128 FERC 61,035 discussed information (Zimmerman *et*	Zimmerman et al. (2008) examined the otolith chemistry of 147 *O. mykiss* from the lower Tuolumne River. Results indicated that only one of these fish was a steelhead (had displayed anadromy). As discussed by Yoshiyama and Moyle (2012), poor migration survival along the migratory pathway (e.g., lower San Joaquin River and south Delta) of any juveniles that do smolt would result in a low probability of their returning to spawn. Narum et al. (2008) and Satterthwaite et al. (2010) suggested that reduced smolt survival through the Delta was the greatest management concern, if the goal was to preserve or enhance expression of anadromy among Central Valley *O. mykiss* populations. The

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				al. 2008) about the origins of *O. mykiss* in the lower Tuolumne River, and concluded: *We have reconsidered staff's findings based on the new information provided in this study. We agree that this information is sufficient to support the conclusion that steelhead are present in the Tuolumne River*. (para. 61, p.24)."	causes for the expression of anadromous or resident life-histories in *O. mykiss* occupying the lower Tuolumne River is poorly understood (TID/MID 2017d, W&AR-10). There is no empirical evidence of a self-sustaining "run" or population of steelhead in the lower river (TID/MID 2013a, W&AR-05). In a letter dated August 18th, 2017, CDFW concludes there is not a steelhead population in the lower Tuolumne River.
95.	Mesick 2008	8	Mesick, C. 2008. The High Risk of Extinction for the Natural Fall-run Chinook Salmon Population in the Lower Tuolumne River due to Insufficient Instream Flow Releases, April 30, 2008.	NMFS states: "However, no viable, independent populations of CCV steelhead have been identified in the Southern Sierra Diversity Group (a geographic area which includes the Tuolumne River) because the populations are either data deficient or at high risk of extinction (Mesick 2008; 2010a)."	It is not clear how these two references to Mesick that deal with fall-run Chinook are related to *O. mykiss*. Perhaps the intended citation is to Lindley et al (2007) which studied *O. mykiss* viability in the Sacramento-San Joaquin Basin. In that study, Lindley et al states: "We are unable to assess the status of Central Valley steelhead ESU with our framework because almost all of the roughly 80 populations are classified as data deficient. The few exceptions are those populations with a closely associated hatchery, and the naturally-spawning fish in these streams are at high risk of extinction." NMFS' direct connection of "data deficient" or "at high risk of extinction" does not appear to be a correct interpretation of Lindley et al (2007), which appears to attribute the high-risk of extinction of the naturally-spawning fish to the existence of hatchery fish.
96.	Mesick 2010a	8	Mesick, C. 2010a. Instream Flow Recommendations For The Stanislaus, Tuolumne, and Merced Rivers to Maintain the Viability of the fall-run Chinook Salmon Populations. Prepared for CSPA by Carl Mesick Consultants, El Dorado, California. February 14, 2010. 29pp.		
97.	Lindley *et al*. 2006	8	Lindley, S.T., R.S. Schick, A. Agrawal, M. Goslin, T.E. Pearson, E. Mora, J.J. Anderson, B.P. May, S. Green, C. Hanson, A. Low, D.R. McEwan, R.B. MacFarlane, C. Swanson, and J.G. Williams. 2006. Historical population structure of Central Valley Steelhead and its alteration by dams. *San Francisco Estuary and Watershed Science* Vol. 4, Iss. 1, 19 pp.	NMFS states: "Historically, the Southern Sierra Diversity Group supported 28 independent CCV steelhead populations (Lindley *et al*. 2006; NMFS 2014d). Because all of the populations in this diversity group are either extirpated or have diminished greatly relative to historical conditions, and the area is important to the viability of the DPS, a key recovery goal is to secure and improve all extant CCV steelhead populations in this diversity group and in the Tuolumne River and reintroduce CCV steelhead to historical habitats above dams."	Lindley et al (2006) identified the potential historical population structure of CCV steelhead based on broad scale modeling of habitat and temperature suitability and dispersal distance. While it is not explicitly clear what water temperature criteria was applied, the paper states that a mean August air temperature of 24°C was applied as an upper limit. Lindley et al (2006, pg 4) also states: "Stream temperature is linearly related to air temperature between 0 and 24°C" and cites to Mohseni (1998) for this statement. However, Mohseni et al (1998) actually states the following: "However, a linear function of air temperature is not sufficient to determine stream temperatures year round." Mohseni concludes with "a nonlinear regression model was developed to estimate weekly stream temperatures as a function of weekly air temperatures." Lindley infers that an upper temperature limit of 24°C was applied to the analysis by citing to Nielsen (1994) which found that "24°C was the upper lethal temperature for juvenile steelhead in northern California." Lindley, a senior NMFS researcher, appears to apply an upper tolerable temperature metric of 24°C for *O. mykiss* while NMFS in its January 29, 2018 comment letter asserts that a 7DADM temperature of 18°C derived from EPA (2003) is needed to protect *O. mykiss.* If EPA (2003) were applied in Lindley et al. (2006), the upper Tuolumne River would have been judged unsuitable historically to support a population of steelhead.
98.	NMFS 2014d	8	[provided above]		While this statement by NMFS does not specifically call out Tuolumne River fish passage as a "recovery goal", the implication is clear. However, Lindley et al (2007) would suggest the temperatures in the accessible upper Tuolumne River would likely be unsuitable for oversummering Chinook and steelhead under even the lowest future temperature increase examined in the study (see Figure 8 and accompanying text). Therefore, Lindley et al (2007) would be more properly interpreted to recommend against considering the upper Tuolumne as being thermally suitable in the future. In any event, the Districts' conducted site-specific studies of the upper Tuolumne River during the La Grange licensing process and these studies supersede the general regional analyses provided in Lindley et al (2007).

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99.	Anchor (2017)	8	[provided above]	NMFS states: "Anchor (2017) concluded that fish passage at Don Pedro and La Grange Dams is feasible, while separate studies conducted by NMFS SWFSC determined that ample habitat exists for steelhead in the upper Tuolumne to support a viable population and that *O. mykiss* in the upper Tuolumne River retain both the genotypic and phenotypic characteristics of ancestral steelhead (SWFSC 2017; 2018)."	The Districts undertook a detailed review of the Anchor (2017) report and found numerous errors and omissions in the study. The Anchor (2017) study is not developed to a stage where a finding of feasibility could reasonably be concluded. The Districts' review comments are provided in their March 15, 2018 filing of Reply Comments.
100.	SWFSC 2018	8	[provided above]		The SWFSC study of upper river carrying capacity does not contain sufficient information to permit a detailed review. A list of data and information has been provided to NMFS and the Districts will provide additional comments after reviewing this additional information. It is noteworthy that the SWFSC did not take into account the effects on fish habitat of the daily hydropeaking flow regime that occurs in the reach. This omission alone renders any conclusion about available fish habitat as highly suspect.
101.	Mesick 2008	9	[provided above]	NMFS states "3) Altered Flow Conditions. The magnitude, duration, and frequency of elevated spring flows in the Tuolumne River have been altered by operations of the Projects which may negatively impact migrating juvenile steelhead. A strong correlation has been established between annual spring flow magnitude and the production of salmonid smolt outmigrants from the Tuolumne River, survival of smolts in the Delta, and the production of adults in the escapement and ocean harvest (Mesick 2008; 2010a)."	See the review above related to lack of reproducibility of Mesick et al. (2008)
102.	NMFS (2014d)	11	[provided above]	NMFS states: "Thus, NMFS (2014d) Recovery Plan identifies both the upper and lower Tuolumne River as locations important to accomplishing recovery of CCV steelhead. Nearly all the historical habitat for CCV steelhead exists in the upper Tuolumne River (Lindley *et al*. 2006)."	NMFS (2014d) Recovery Plan classifies the upper Tuolumne River as a Core 2 population which NMFS (2014 d) designates as being "of secondary importance for recovery efforts" as compared to Core 1 populations. Lindley et al (2006) is a regional assessment of potential historical habitat. The Districts' detailed studies of the upper Tuolumne River provide much more detailed investigations of the upper Tuolumne River. Applying NMFS' recommended temperatures for steelhead in the lower Tuolumne River to steelhead in the upper Tuolumne River results in there being little to no thermally suitable oversummering habitat under historical conditions in the portions of the upper Tuolumne River below unpassable physical barriers.
103.	Lindley *et al*. 2006	11	[provided above]		
104.	Lindley *et al*. 2007	13	[provided above]	NMFS states: "Estimates of CV fall-run Chinook escapements in recent years, 2005-2009, are 719, 625, 224, 372, and 124 fish, respectively. By reference to quantitative extinction models and criteria for CV Chinook salmon, the Tuolumne population is not presently considered viable (Lindley *et al*. 2007; Mesick 2008; 2010a)."	NMFS and FERC have both acknowledged that adverse ocean conditions significantly affected fall-run Chinook escapements during the 2005 to 2009 time period. The citation to Lindley et al (2007) is be misplaced. In the cited Lindley work, the Tuolumne river is mentioned exactly once, as follows: *"By 2100, mean summer air temperatures are expected to rise by at least 2°C. Under this scenario, the amount of habitat above the 25°C isotherm is reduced, but in general, most streams that historically contained habitat above this isotherm would not lose all such habitat. The exceptions are the Tuolumne, Merced, and upper San Joaquin rivers, and Butte Creek, where the 25°C isotherm might just rise to the upper limit of the historical distribution of spring-run Chinook salmon."* If anything, Lindley et al (2007) would suggest that the upper Tuolumne River would be a poor choice for recovery of spring-run Chinook because of the likelihood of unsuitable thermal conditions even under the smallest of the anticipated climate change scenarios.

No	Citation	Pg No.	Full Reference	Context of Citation	Analysis
105.	USEPA 2003		USEPA. 2003. *USEPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards.* EPA 910-B-03-002. Region 10 Office of Water, Seattle, Washington.	NMFS states: "Currently, CCV steelhead and CV Chinook salmon habitats are limited downstream of La Grange Dam by water flow, water temperature, lack of substrates, and a lack of floodplain and cover. In addition, the U.S. Environmental Protection Agency (USEPA), pursuant to Clean Water Act section 303(d) and 40 CFR 130.7(d)(2), listed the lower Tuolumne River as impaired for suitable water temperatures for CCV steelhead and all other salmonids, based on USEPA's 2003 Water Temperature Criteria (USEPA 2003; USEPA 2011)."	EPA (2003) suggests temperature benchmarks for certain salmon and steelhead life stages derived from a literature search. EPA (2003) specifically states that site-specific information on local streams is preferred. The Districts have collected data on Tuolumne River salmon and steelhead and applied this data to studies conducted as part of the ILP. Studies W&AR-04 (TID/MID 2013b); W&AR-06 (TID/MID 2017a); W&AR-08 (TID/MID 2013d); and W&AR-10 (TID/MID 2017b), and results of RST monitoring provide empirical data to analyze conditions and alternatives for Tuolumne River fisheries, as recommended by EPA (2003). These and other studies provide the actual conditions on the Tuolumne River, and show there are suitable habitat conditions to support large populations of *O. mykiss* and fall-run Chinook. Hatchery influences and predation by non-native species are significant impediments to increased populations. We refer NMFS to the studies conducted as part of the ILP.
106.	USEPA 2011		USEPA. 2011. Letter from Alexis Strauss, Director, Water Division, Environmental Protection Agency (USEPA) to Tom Howard, Executive Director, State Water Resources Control Board, Re: "The Final List of Water Bodies that EPA is Adding to California's 2008 to 201 0 List of Water Quality Limited Segments Still Requiring Total Maximum Daily Loads Pursuant to Clean Water Act, Section 303(d), and 40 CFR 130.7(d)(2)." USEPA, Region IX, San Francisco, California. October 11, 2011.		
107.	McBain and Trush 2004	15	McBain & Trush, Inc. 2004. Coarse sediment management plan for the lower Tuolumne River. Revised Final Report. Prepared by McBain & Trust, Arcata, California for TRTAC, Turlock and Modesto Irrigation Districts, USFWS Anadromous Fish Restoration Program, and California Bay-Delta Authority.	NMFS states: "Implementing our Preliminary Terms should benefit the entire 52 miles of the lower Tuolumne below La Grange Dam to the confluence with the San Joaquin River, including the following reaches (McBain and Trush 2004): (1) Spawning Reach (RM 52.0 - 47.5) La Grange Dam to Basso Bridge [4.5 RM]. (2) Dredger Reach (RM 47.5 - 39.5) Basso Bridge to Roberts Ferry [8.0 RM]. (3) Mining Reach (RM 39.5 - 36.3) Roberts Ferry to Santa Fe Bridge [3.2 RM]. (4) Lower Tuolumne River (RM 36.3 to RM 00.0) [36.3 RM]."	Aside from confusing the various River Mile locations, citing to McBain and Trush (2004) as the basis to judge "benefits" of proposed measures is misplaced. FERC-approved ILP study W&AR-04: *Spawning Gravel in the Lower Tuolumne River* was specifically intended *to* examine the current conditions related to coarse sediment budget, bedload transport, and availability of spawning habitat in the lower Tuolumne River, thereby updating the McBain & Trush (2004) study to present conditions.
108.	NMFS 2014d	23	[provided above]	NMFS states: "This habitat downstream of La Grange Dam is affected by inadequate water flow, water temperature, lack of substrates, and a lack of floodplain/cover due to the current operation and maintenance of the Projects (NMFS 2014d). FERC's (1995) study supports this and noted that the Projects could directly affect flows, gravel and large woody debris (LWD) transport, and water temperatures all the way through the Delta."	NMFS' cite to FERC (1995) as "supporting" inadequate habitat, water flow, substrates, etc downstream of La Grange is a gross mischaracterization of FERC (1995) which does not even discuss the habitat in the lower Tuolumne River. This citation is improper, incorrect, and wrong. The purpose of FERC (1995) was to identify FERC licensed project which might have the *potential* for producing *cumulative impacts* on the *Bay-Delta*.
109.	FERC (1995)	23	[provided above]		

No	Citation	Pg No.	Full Reference	Context of Citation	Analysis
110.	Lindley *et al*. 2006	25	[provided above]	NMFS States: "While O. *mykiss* distribution has expanded downstream after increased flow releases mandated under the 1996 settlement agreement, the ~5 miles of available habitat remains a fraction of the 100+ miles of summer rearing habitat that was historically available to salmonids above the Projects (Lindley *et al*. 2006)."	ILP studies W&AR-04 (TID/MID 2013b), W&AR-08 (TID/MID 2013d), W&AR-10 (TID/MID 2017b, W&AR-12 (TID/MID 2017d) and temperature suitability studies done as part of W&AR-14 (Farrell et al 2017), all of them reviewed by NMFS, provide Tuolumne River-specific information about *O. mykiss* habitat on the lower Tuolumne River. Among other things, these studies show (1) that there is suitable spawning habitat in the lower Tuolumne River for over 800,000 *O. mykiss*, (2) *O. mykiss* are regularly observed in snorkel surveys down to RM 36, 16 miles (not 5 miles), below LGDD, (3) in-river fry and juvenile rearing habitat is abundant and not a limiting factor for *O. mykiss*, and (4) wild Tuolumne River *O. mykiss* are thermally acclimated to local Tuolumne River temperature regimes and display high thermal capacity (Verhille et al 2016). Lindley et al (2006) was a broad-scale, regional study covering almost the entire State of CA. Districts' detailed studies update the Lindley et al (2006) study with Tuolumne-specific data on historical physical barriers, river-specific temperatures, and river-specific habitat.
111.	EPA (2003)	26	[provided above]	NMFS states: "Using the EPA (2003) criteria, the Districts' (2017a;b) AFLA/FLA flow proposal would only provide protection to ESA listed CCV steelhead in the upper ~5 miles of habitat at the most. Given that the Projects block access to over 100 miles of historic habitat, the scale of habitat created below the dam fails to completely mitigate for the fish passage effects of the Project, or help recover the species." NMFS states: "NMFS flows would create habitat for juvenile salmonid rearing, defined as the 7-day average of daily maximum temperatures (7DADM) of 18°C or less by EPA (2003) for ~12 miles in the lower Tuolumne during wet, above normal, and below normal water years, depending on meteorological conditions. During dry and critically dry years, rearing could extend downstream for ~5 miles, depending on meteorological conditions. NMFS flows during dry and critically dry years are lower due to concerns of water availability, but still provide protection for rearing below La Grange Dam. NMFS 10(j) flows allow the O. *mykiss* population to survive these dry periods so the populations can recover during the years with normal to wet conditions."	Using EPA (2003) "criteria", the Districts' Preferred Plan provides approximately nine miles of thermally suitable *O. mykiss* habitat in the lower Tuolumne River (see AFLA, pg 5-29). Using the same EPA (2003), the historically accessible upper Tuolumne River provides ZERO miles of thermally suitable habitat (see Districts' Upper Tuolumne River Temperature study (TID/MID 2018, Appendix M). According to ILP study of Effective Usable Habitat provided in the AFLA, the Districts' Preferred Plan provides, between RM 52 and RM 39.5, a total of 1,500,000 square feet of usable habitat for *O. mykiss* juveniles in the warmest summer months (July/August) in 80% of the years assuming an allowable 7DADM temperature of 18°C. This habitat area is sufficient to support 90,000 juvenile *O. mykiss* at a territory size of 0.06 fish per square foot. .
112.	Young *et al*. 2011	27	Young, P.S., Cech, J.J.,Thompson, L.C. 2011. Hydropower-related pulsed-flow impacts on stream fishes: a brief review, conceptual model, knowledge gaps, and research needs.	NMFS states: "Pulse flows have long been used to help partially mitigate for changes in hydrology that occur following the construction of a dam as described in numerous scientific studies (*e.g.* Young *et al*. 2011)."	The Districts' proposed pulse flows are designed for the express purpose of aiding the downstream migration of parr- and smolt-size juvenile fall-run Chinook when the fish are naturally motivated to outmigrate. NMFS' proposed high flow rates in January and February (up to 400 cfs and 500 cfs, even 3,000 cfs in Wet years) are likely to have detrimental impacts on Chinook fry. Tuolumne River

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			Rev FishBiol Fisheries (2011) 21:713–731.		ILP study results (see AFLA, Exhibit E, Figure 5.6-2), show that these flows are actually placed at the very minimum WUA for Chinook fry, the opposite of the goal of a desired biological functional flow. NMFS' flows will result in displacing fry well downstream and even out of the Tuolumne River to areas with higher densities of non-native predators. The Districts Otolith Study (TID/MID 2016, W&AR-11) indicates that fall-run Chinook that leave the Tuolumne River as fry make up a very small percent (<5%) of returning adults. In fact, CDFW has cautioned the Districts about higher than necessary wintertime releases, stating in a letter to the Districts dated September 29, 2017, and copied to FERC, that "large wintertime releases can cause redd scouring as well as downstream displacement of fry." Also, studies on the lower American River reported in Sellheim et al (2015), as cited by USFWS in its Attachment 5 of its January 29, 2018 filing, caution that high flows when fry are in the river create conditions where fry can be swept downstream to the Sacramento River and Bay-Delta and be subject to low survival. NMFS' artificially high flows provide the least favorable habitat conditions for fry as measured as percent of maximum WUA, and are likely to have an overall adverse effect on the fall-run Chinook population.
113.	Bellmore *et al.* 2013	28	Bellmore, J.R., C.V. Baxter, K. Martens, and P.J. Connolly. 2013. The floodplain food web mosaic: a study of its importance to salmon and steelhead with implications for their recovery. *Ecol. Appls. 23:189–207*. http://dx.doi.org/10.1890/12-0806.1	NMFS states: "There are many studies showing the positive relationship between salmonid growth and survival when juvenile salmonids have access to off-channel areas and floodplains (*e.g.*, Bellmore *et al.* 2013, Jeffres *et al.* 2008, Hayes *et al.* 2008, Limm and Marchetti 2009, Opperman 2012, Opperman *et al.* 2010, Sommer *et al.* 2001)."	Bellmore et al. (2013) presents the results of a detailed study of food web structures for rearing salmon and steelhead in the Methow River in Washington State. Bellmore et al. (2013) points out the heterogeneity of floodplains and sloughs and emphasizes the need for location-specific, quantitative data on the floodplain food webs to inform natural resource management. No such equivalent level of information for the Tuolumne River is provided or cited by NMFS. If anything, Bellmore et al. (2013) could be cited to argue *against* making resource management recommendations without site-specific supporting data. It is worth noting that the Bellmore et al (2013) study did not evaluate survival and implying that it does is inappropriate.
114.	Jeffres *et al.* 2008	28	Jeffres, C.A., J.J. Opperman, and P.B. Moyle. 2008. Ephemeral floodplain habitats provide best growth conditions for juvenile Chinook salmon in a California river. Environmental Biology of Fishes 83(4):449-458.		Jeffres et al. (2008) is a widely cited and informative study performed on the Cosumnes River, a tributary to the lower San Joaquin River. It may also be one of the most misquoted studies. Jeffres et al (2008) is often, as it is here by NMFS, cited as an example of increased salmonid growth and survival resulting from floodplain rearing. Of course, the reasonable question is "increased" compared to what, and the answer to that has to be "compared to in-channel rearing". And here is what Jeffres et al (2008) found over the two years of study that were conducted: *"Our study indicates that off-channel floodplain habitats provide significantly better rearing habitat, supporting higher growth rates, than the **intertidal river channel**"* [emphasis added]. The Tuolumne is not an "intertidal river channel". Related to in-river channel rearing, Jeffres et al (2008) found that in the 2004 study year, the size of the juvenile fish located in the ***non-tidal river channel*** location upstream of the floodplain "*increased rapidly"* and by the end of the season *"fish in the **river site** upstream of the floodplain were statistically grouped with the fish in the ephemeral floodplain sites, with greater lengths than fish placed in both the lower pond and river below the floodplain habitats" (emphasis added).* In study year 2005, after the first 20 days of being in the river, *"fish in the flooded vegetation (site), upper pond, and **above the floodplain (in-river site**) had increased in length significantly more than fish in the lower pond and below the floodplain (other in-river site)"*. Jeffres et al (2008) not only does not support "greater growth" resulting from floodplain rearing compared to in-channel rearing, the Districts counter that Jeffres et al (2008) would argue against the usefulness of floodplain rearing, especially when in-channel food sources are plentiful, as they are in the Tuolumne River. Something apparently overlooked by NMFS in the Jeffres et al (2008) study is a finding related to temperature. Jeffres et al (2008) observed that *"[t]emperature on the [Cosumnes] floodplain for a 1-week period had a daily average of 21°C and reached a daily maximum of 25°C and fish continued to grow."* And lastly, Jeffres et al (2008) did not study or report on survival vs floodplain rearing, not did it find any "positive relationship" between survival and floodplain rearing.
115.	Hayes *et al.* 2008	28	Hayes, S. A., M. H. Bond, C. V. Hanson, E. V. Freund, J. J. Smith, E. C. Anderson, A. J.		Hayes et al (2008) compared *O. mykiss* growth in a coastal lagoon to the upper watershed of the lagoon's tributary (Scott Creek). The words "floodplain" or "off-channel" do not occur in the article

No	Citation	Pg No.	Full Reference	Context of Citation	Analysis
			Ammann, and R. B. Macfarlane. 2008. Steelhead Growth in a Small Central California Watershed: Upstream and Estuarine Rearing Patterns. *Trans. Amer. Fish. Soc. 137(1):114-128.*		and there is no comparison of growth or survival of floodplain-reared fish vs. in-channel reared fish.
116.	Limm and Marchetti 2009	28	Limm, M.P. and M.P. Marchetti. 2009. Juvenile Chinook salmon (*Oncorhynchus tshawytscha*) growth in off-channel and main-channel habitats on the Sacramento River, CA using otolith increment widths. Environmental Biology of Fishes 85:141-151.		Limm and Marchetti (2009) examined fall-run Chinook otoliths of fish sampled from main channels, off-channel ponds, and non-natal tributaries in the upper Sacramento River to try to differentiate growth rates from these different habitats. Contrary to NMFS' indication, survival rates due to using the different habitats was not studied. Nor was floodplain use strictly studied as off-channel ponds represent only one form of floodplain habitat and these are generally rare on the Tuolumne River floodplains, as well as being inhabited by non-native predators. However, the Limm and Marchetti (2009) study points to the potential value of otolith studies for determining river-specific growth rates and other information. The Districts, in coordination with CDFW and UC Santa Cruz, conducted a study of the otoliths of fall-run Chinook adults returning to the Tuolumne River from various outmigration water years (see TID/MID 2016, W&AR-11). Based on strontium (Sr) isotope ratios (87Sr/86Sr) and otolith microstructural features, the study results indicated that mean fish size at exit from the Tuolumne River showed no apparent relationship with WY type, with the exception of outmigration year 2000 when mean fish size was significantly different ($p<0.005$) from the other four years of the study. Mean fish size at freshwater exit from the Delta also did not exhibit a relationship with WY type. Based upon the limited number of sampling years and otoliths available for analysis by this study, it is apparent that spawning populations in the Tuolumne River exhibit low representation of early emigrating fry, with zero contributions in three out of five outmigration years analyzed and a maximum contribution of 5% in WY 2000.
117.	Opperman 2012	28	Opperman J. 2012. A conceptual model for floodplains in the Sacramento-San Joaquin Delta. San Francisco Estuary and Watershed Science, 10(3): article 4. 28 p. Available: http://escholarship.org/uc/item/2kj52593		Opperman (2012) presents a general description of floodplain processes which serve to demonstrate the complexity and heterogeneity of floodplains, and suggest that every floodplain has unique traits that should be studied and understood as a prerequisite to specific resource management decisions. The Districts point out two items in the Opperman paper: (1) Figure 11 on page 9 is improperly described as the smaller fish in the photo were captured from the ***inter-tidal river channel and not the main-channel.*** The Jeffres et al (2008) study specifically stated that juveniles in the main channel upstream of the floodplain (not the inter-tidal channel) grew at approximately the same rate as those on the floodplain; and (2) juvenile Chinook within enclosures on the Cosumnes River floodplain continued to grow rapidly even as daily afternoon temperatures reached levels considered lethal tosalmon (25 ºC). This observation suggests that the salmon were able to tolerate these temperatures because of the high density of prey. Therefore, Opperman (2012), citing to Jeffres et al (2008), observes that CV juvenile fall-run Chinook may have sustained growth at temperatures significantly higher than those identified in EPA (2003).
118.	Sommer *et al.* 2001	28	Sommer T.R., Nobriga M.L, Harrell W.C. Batham W, and. Kimmerer W.J. 2001. Floodplain rearing of juvenile Chinook salmon: evidence of enhanced growth and survival. Can. J. Fish. Aquat. Sci. 58: 325–333 (2001)		Sommer et al (2001) reports on studies conducted on the 60,000 acre Yolo Bypass floodplain along the Sacramento River, a floodplain with little in common with the 600 acre Tuolumne River floodplain. However, it is informative to note that as reported in Sommer et al. (2001), temperatures observed on the Yolo Bypass floodplain were up to 5°C higher than the adjacent river. Sommer et al. (2001) found the following: "[a]pparent growth differences between the two areas [Sacramento River channel and floodplain] are consistent with water temperatures and stomach-content results. We found that the Yolo Bypass floodplain had significantly higher water temperatures and that young salmon from the floodplain ate significantly more prey than those from the Sacramento River". The various studies of the Yolo Bypass suggest that greater growth of juvenile salmon resulting from floodplain access is due to *both* increased temperatures on the floodplain compared to the adjacent river and substantial food availability. Studies on the Tuolumne River (see Stillwater Sciences 2012, and

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					Attachment R) found no difference between floodplain and in-river temperatures. NMFS flows are intended to maintain EPA (2003) temperatures, which are significantly lower than the high temperatures observed on the Yolo Bypass (~20°C). With regard to survival benefits of floodplain rearing, Sommer et al (2001) states: *"Recoveries of paired releases were too few to determine whether the higher survival indices for the Yolo Bypass release groups represent actual survival differences or random variation."*
119.	Sturrock *et al*. (2015)	28	Sturrock A.M., Wikert J.D., Heyne T., Mesick C., Hubbard A.E., Hinkelman T.M., *et al*. 2015. Reconstructing the Migratory Behavior and Long- Term Survivorship of Juvenile Chinook Salmon under Contrasting Hydrologic Regimes. PLOS ONE 10(5): e0122380. doi:10.1371/journal.pone.0122380	NMFS states: "Figure 3 from Sturrock *et al*. (2015) below shows the strong correlation between adult returns and springtime flows that those fish experienced as juveniles outmigrating from the Tuolumne/San Joaquin system."	The referenced figure, while included in Sturrock et al (2015), is cited back to The Bay Institute by Sturrock. However, this widely cited figure was also used in the SWB's Draft SED as Figure 19-1. NMFS' description of the figure as being applicable to the "Tuolumne" is an invention by NMFS, is improper and in error. This figure presents no data or useful information about the Tuolumne River.
120.	Mesick and Marston (2007)	28	No title or reference provided in the NMFS list of literature.	NMFS states: "Mesick and Marston (2007) found that instream flow releases in the Tuolumne River, from February 1 through June 15, as gauged at La Grange, explained approximately 82% of the variation in Tuolumne River CV fall-run Chinook salmon recruitment. They also found that factors outside of the Tuolumne River explained very little variation in the adult CV fall-run Chinook salmon recruitment in the Tuolumne River."	The NMFS list of literature does not contain this citation; therefore, there is no way for the Districts to review it. In 2013, the Districts under a CDFW FOIA requested a copy of a Mesick and Marston (2007) report cited by CDFW. It was not provided and was not able to be found, according to CDFW. Citing to and relying on a report which cannot be located is improper. The Districts request that NMFS provide this cited Mesick and Marston (2007) report, or notify FERC that the document cannot be found, is not relied upon by NMFS, and should not be relied upon by FERC.
121.	Poff *et al*. 1997	29	Poff, N.L., J.D. Allan, M.B. Bain, J.R. Karr, K.L. Pretegaard, B.D. Richter, R.E. Sparks and J.C. Stromberg, 1997. The natural flow regime: a paradigm for river conservation and restoration. BioScience 47(11):769-784.	NMFS states: "The inundation duration [30 to 90 days] is based on establishment of BMI guilds: shredders, conditioners, collectors (Poff *et al*. 1997, Short & Maslin 1977) contributing to the prey base for salmonids (Allen *et al*. 2003)."	Poff et al (1997) contains no mention of needed times of inundation duration. There is no reference in Poff et al (1997) to either 30 or 90 days; the words "guilds", "shredders", "conditioners", or "collectors" do not appear in the article. Nor does "BMI"; the word "macroinvertebrate" appears once in a reference to being potentially able to be modeled by IFIM.
122.	McBain and Trush 2004	30	[provided above]	NMFS states: "Over the lifetime of the licenses (anticipated to be 40 years) - The Districts shall be responsible for adding a total volume of 752,000 cubic yards (cy) of coarse gravel within the four reaches noted above of the lower Tuolumne River at a rate of 18,800 cubic yards per year (cy/y), in consultation with the TRTAC, to mitigate for the 18,800 cy/y of sediment/gravels trapped annually by the Projects (McBain and Trush 2004)."	NMFS cite to McBain and Trush (2004) is overbroad and in error. First, NMFS cites McBain and Trush (2004) as estimating the volume trapped annually by the Districts' project as 18,800 cy/yr. The 2004 report specifically states the ***unimpaired c***oarse sediment supply as 18,800 cy/yr. NMFS makes no effort to reduce this amount by the coarse sediment trapped in CCSF's three dams -- O'Shaughnessy Dam, Cherry Lake Dam, Eleanor Dam – all of which are located upstream of Don Pedro reservoir and which trap sediment from a large portion of the watershed. McBain and Trush (2004) made no effort to independently estimate sediment capture in Don Pedro Reservoir, instead relying on generalized estimates provided in Brown and Thorpe (1947). NMFS cite to McBain and Trush (2004) as the source of that estimate is in error. In any event, this estimate was not of importance to the McBain and Trush (2004) study which focused on the issue of sediment transport and bedload supply in the ***lower*** Tuolumne River, the subject of the study. NMFS misapplies and misstates the context of the McBain and Trush (2004) work. The stated purpose of the study was to identify and prioritize sites and alternative methods to augment coarse sediment (and salmon spawning gravel) in the gravel-bedded reaches ***below La Grange Diversion Dam***. To address this express purpose, McBain and Trush analyzed geomorphic processes downstream of LGDD given the flow regime resulting from the flood control and water supply operations of the new Don Pedro Reservoir. McBain and Trush (2004) reported on the results of a number of field studies. According to the 2004 report, it was determined that the average annual sediment transport rate in the lower Tuolumne River (for sediment > 8 mm) was 8,600 tons/yr (5,400 cu yds/yr). Excluding the flood flow of record occurring in the 1997 water year, the average annual

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					bedload transport rate (for sediment > 8 mm) was 1,930 tons/yr (1,211 cu yds/yr). NMFS implies that McBain and Trush (2004) identifies the need for 18,800 cy/yr of gravel augmentation. This is not the case. Using 70 year old general approximations of unimpaired sediment delivery from the watershed as the basis for a PM&E measure is unfounded. The Districts specifically undertook study W&AR-04 (TID/MID 2013b) to evaluate the effects of the Don Pedro Project on gravel supplies, bedload transport and gravel loss in the lower Tuolumne River and update the McBain and Trush (2004) work. Scott McBain, a primary author of the 2004 work, was a member of the team that conducted W&AR-04. The express purpose of W&AR-04 was to update gravel transport and gravel availability information on the lower Tuolumne River and use it as the best information available to inform PM&E measures.
123.	McBain and Trush 2004	31	[provided above]	NMFS states: "Create new floodplain area - Sediment harvest downstream of La Grange Dam shall be completed in a manner that creates new floodplain areas, and in-channel placement shall be completed in a manner that increases local floodplain inundation (e.g., raises the channel bed). The following volumes and rates are from McBain and Trush (2004)"	W&AR-04 (TID/MID 2013b) updated the McBain and Trush (2004) estimates of bedload transport and gravel loss in the lower Tuolumne River. The Districts' gravel augmentation plan is based on this study. The proposed volume of gravel augmentation exceeds the estimated gravel loss and proposes additional gravel augmentation measures at key locations.
124.	Jager *et al*. (1997)	31	Jager, H. I., H. E. Cardwell, M. J. Sale, M. S. Bevelhimer, C. C. Coutant, and W. VanWinkle. 1997. Modeling the linkages between flow management and salmon recruitment in streams. Ecological Modeling 103: 171-191.	NMFS states: "…(e) Redd density in the Tuolumne River can be approximated to estimate capacity because spawnable area includes 4 x redd area to account for defensible space. This is based on Jager *et al*. (1997) who uses a theoretical average defended redd area of about 20 m^2 (equates to about four times the actual redd area), as cited in Burner (1951)."	ILP study W&AR-04 (TID/MID 2013b), the study plan and draft report, all of which went through extensive consultation with NMFS and other resource agencies, provides site-specific estimates of spawning capacity for fall-run Chinook and *O. mykiss*.
125.	Merz *et al*. 2004		Merz, J. E., Setka, J.D., Pasternack, G.B., and Wheaton, J.M. 2004. Predicting benefits of spawning habitat rehabilitation to salmonid (*Oncorhynchus* spp.) fry production in a regulated California River. Can. J. Fish Aquat. Sci. 61: 1433-1446.	NMFS states: "(f) Increase annual average of egg-to-emergence survival for CV Chinook salmon and CCV steelhead by 24% (Merz *et al*. 2004)"	NMFS cites several goals and metrics for sediment management for the lower Tuolumne River, none of them derived from the site-specific studies on the lower Tuolumne River conducted during the Don Pedro relicensing process. This specific reference is to a report on results of gravel augmentation on the Mokelumne River, and the specific reference to 24% comes from an unrelated egg-tube test and not an in-situ observation on the Mokelumne River. Its relevance to the lower Tuolumne River is not described.
126.	Kondolf 1997		Kondolf, G. M. 1997. Hungry Water: Effects of Dams and Gravel Mining on River Channels. Department of Landscape Architecture and Environmental Planning, University of California, Berkeley, California. Environmental Management Vol. 21, No. 4, Pp. 533–551. Springer-Verlag Inc., New York.	NMFS states: "The reaches of suitable anadromous CV salmonid habitats in the lower Tuolumne River have been substantially reduced due to historical and ongoing anthropogenic influences including dam construction, in-river aggregate mining, in-river gold dredging mining, and the conversion of floodplain habitat for agricultural uses (Kondolf 1997)."	This statement attributed to Kondolf (1997) does not exist in the cited article. In fact, as close to this article gets to reporting on gravel conditions on the Tuolumne River is as follows: *"On the Merced, Tuolumne, and Stanislaus rivers in California, a total of ten sites were excavated and back-filled with smaller gravel to create spawning habitat for chinook salmon from 1990 to 1994. However, the gravel sizes imported were mobile at high flows that could be expected to occur every 1.5–4.0 years, and subsequent channel surveys have demonstrated that imported gravels have washed out (Kondolf and others 1996a,b)."* And even then, the study is outdated. ILP study W&AR-04 (TID/MID 2013b) deals with current gravel and spawning conditions on the Tuolumne River.

No	Citation	Pg No.	Full Reference	Context of Citation	Analysis
127.	McBain and Trush (2004)	32	[provided above]	NMFS states: "McBain and Trush (2004) describes, in their Coarse Sediment Management Plan, suitable and existing conditions, and sets priorities for restoration of CCV steelhead and CV Chinook salmon holding, spawning, and rearing habitats in the Tuolumne River."	The purpose of ILP study W&AR-04 (TID/MID 2013b) was to update the prior, older work by McBain & Trush. NMFS was heavily involved in the scoping and review of the W&AR-04 study. Scott McBain was part of the Districts' scientific team member on W&AR-04.
128.	CDWR 1994	32	California Department of Water Resources (DWR). 1994. San Joaquin River tributaries, spawning gravel assessment, Stanislaus, Tuolumne, and Merced Rivers. Draft memorandum prepared by the Department of Water Resources, Northern District for CDFG. Contract number DWR 165037.	NMFS states: "In the Tuolumne River, as in many Central Valley systems, the Projects block access to spawning habitat in the upper river and blocks the transport of gravel and LWD into downstream reaches. There is a deficit in coarse sediment supply relative to bedload transport downstream of La Grange Dam, which affects both the capacity and productivity of salmonid spawning habitat (CDWR 1994, McBain and Trush 2004)…"	ILP study W&AR-04 was designed to, and did, determine the coarse sediment deficit and bedload transport downstream of La Grange Diversion Dam. W&AR-04 (TID/MD 2013b) found the following: *"Approximately 5,913–8,720 tons of coarse (>2 mm) bedmaterial was lost from storage in sediment budget Cells 1–3 (encompassing the Dominant Salmon Spawning Reach) between 2005 and 2012. Gravel augmentation has helped increase coarse sediment storage in the reach, and 94 percent of the coarse sediment added through augmentation was retained."* W&AR-04 also found: *"The total estimated volume lost [from cells 1-3] is comparable in magnitude to the quantity of coarse sediment added during any one of the augmentation projects that has occurred since 2002 (approximately 7,000–14,000 tons)."* The Districts relied on ILP study W&AR-04 to inform the gravel augmentation component of the Preferred Plan.
129.	McBain and Trush 2004	32	[provided above]		
130.	McBain and Trush 2004	32-33	[provided above]	NMFS states: "The annual bedload sediment deficiency from the Projects' capture was estimated to be an average of 18,800 cy/y (McBain and Trush 2004). The rate of bedload transport was estimated to be 5,400 cy/y (McBain and Trush 2004)."	NMFS citing to the "Project's capture" provided in McBain and Trush (2004) is in error. The reference to 18,800 cy/yr by McBain and Trush (2004) is to an estimate reported in Brown & Thorpe (1947) of the "unimpaired" sediment yield of the watershed. The estimate of bedload transport of 5,400 cy/yr is correctly attributed to McBain and Trush (2004) and is relatively close the update value determined in W&AR-04 (TID/MID 2013b). Applying the "unimpaired" sediment yield of the entire watershed misrepresents the yield to Don Pedro Reservoir. Furthermore, relying on the Districts' estimate of sediment accumulation in the Don Pedro Reservoir as an estimate of the annual bedload transport to the lower Tuolumne River lacks scientific support. First, the relative accuracies of the Districts' 2012 bathymetry and the pre-old Don Pedro topography circa 1920s are substantially different. It is just as likely that the most recent bathymetry could have indicated a gain in storage as a loss. The Districts' purpose in collecting the detailed bathymetry was to provide input to the W&AR-03 (TID/MID 2017f): Reservoir Temperature Model, a 3-D model needing detailed bathymetry. Secondly, bedload transport rates of coarse sediment from upstream of Don Pedro Reservoir to downstream of La Grange headpond have not been computed. It is known that large gravel depositional areas existed in the Jacksonville mining area (RM 70.5) and likely in Middle Bay (RM 59).
131.	McBain and Trush 2004		[provided above]	NMFS states: "The Projects' dams block some 18,800 cy/y of bedload (coarse and spawning gravels) and this annual amount must be put back into the river downstream of La Grange Dam so that critical habitat and EFH is not further degraded (NMFS 2014d; McBain and Trush 2004)."	As discussed above, the reference to 18,800 cy/yr is in error. Also, citing to McBain and Trush (2004) as concluding either that "this amount must be put back into the river" or that "critical habitat and EFH is not further degraded" misrepresents the MaBain and Trush (2004) work.
132.	McBain and Trush (2004)	33	[provided above]	NMFS states: "In addition, to mitigate for the dams' many decades of blocking gravel transport, the total volume of 752,000 cy (564,000 cy for bedload traps and 188,000 cy for spawning enhancement) estimated by McBain and Trush (2004) must be placed within the 52 RM downstream of La Grange Dam."	It is erroneous for NMFS to cite to McBain and Trush (2004) as support for the statement that a specified quantity of gravel must be deposited to the lower Tuolumne River to "mitigate for the dams' many decades of blocking gravel transport". McBain And Trush (2004) contains estimates of bedload transport for the lower Tuolumne River below LGDD.

No	Citation	Pg No.	Full Reference	Context of Citation	Analysis
133.	Albertson *et al*. (2012)	37	[provided above]	NMFS states: "When comparing the lower Tuolumne River with 19 other California salmonid bearing streams, Albertson *et al*. (2012) found that the lower Tuolumne River is very limited in salmonid rearing habitat attributes, little to no LWD, no undercut banks, and only a thin riparian edge. Comparing the available data on the Tuolumne River with other nearby regulated rivers clearly indicates that the Tuolumne River downstream of the Projects is severely lacking in wood."	This cite to Albertson et al. (2012) is misuse of a citation. Albertson et al. (2012) reports on a study of the ***Merced River.*** Albertson et al.(2012) concludes nothing about the Tuolumne River, which is not the subject of the report. In fact, reading the various plots, where the Tuolumne River can be distinguished (by the designation "Tu"), the Tuolumne scores well in invertebrate population, but NMFS does not mention this. The Tuolumne River also appears to compare favorably in the other plots as well. Albertson et al (2012) says nothing about the Tuolumne River having "a thin riparian edge" or "little to no LWD". Unless NMFS intended to refer to a different cite, then this is simply misplaced. If actually intended as a cite to Albertson et al. (2012), then this use would be fabricated Here's what the article states about the ***Merced River*** : *" However, compared with other [19] streams in the region, the Merced has minimal riparian cover, fewer undercut banks, less woody debris and higher water temperatures, suggesting that these factors might limit salmon recovery."*
134.	Bisson *et al.* 1987	37	Bisson, P. A., R. E. Bilby, M. D. Bryant, C. A. Dolloff, G. B. Grette, R. A. House, M. L. Murphy, K. V. Koski, and J. R. Sedell. 1987. Large Woody Debris in Forested Streams in the Pacific Northwest: Past, Present and Future. Pages 143-190 in E.O. Salo and T.W. Cundy, editors. Streamside Management Forestry and Fishery Interactions. Univ. of Wash., Institute for Forest Resources, Contribution 57, Seattle, WA.	NMFS states: "Anchored or lodged LWD can create complex in-channel hydraulics that promote zones of scour and deposition, creating accumulations of spawning gravels for Pacific salmon, providing hydraulic refugia (Bisson *et al.* 1987), and creating pools by forcing flows to scour channel beds and banks."	ILP studies W&AR-12 (TID/MID 2017d) and W&AR-19 (TID/MID 2013c) contain detailed studies of LWD and riparian resources in the Project area. Referring to generalized studies does not inform the development of license conditions.
135.	Naiman *et al.* 2002	28	Naiman, R. J., R. E. Bilby, D. E. Schindler, and J. M. Helfield. 2002. Pacific salmon, nutrients, and the dynamics of freshwater and riparian ecosystems. Ecosystems 5: 399–417.	NMFS states: "Moreover, structural properties of LWD are a factor in the retention of salmonid carcasses, which provide important marine-derived nitrogen (N) to N-limited terrestrial ecosystems and organic nutrients to salmon juveniles, macroinvertebrates, terrestrial animals, and birds (Naiman *et al.* 2002; Merz and Moyle 2006)."	ILP studies W&AR-12 (TID/MID 2017d) and W&AR-19 (TID/MID 2013c) contain detailed studies of LWD and riparian resources in the Project area. Referring to generalized studies does not inform the development of license conditions.
136.	Anchor (2017)		[provided above]	NMFS states: "Future fish passage seems certain: Anchor (2017) notes that fish passage for CCV steelhead and CV spring-run Chinook salmon into the upper Tuolumne River is feasible"	The Districts have conducted a detailed review of the Anchor (2017) report in its March 15, 2018 Reply Comments and do not comment further in this table.
137.	Lindley *et. al*., 2007	44	[provided above]	NMFS states: (3) Identify the number and origin of the selected target species to be released into habitats upstream of Don Pedro Reservoir. The selection of a reintroduction stock would be assessed and determined through the development and ongoing implementation of a *Stock Selection and Management Plan* and associated genetic studies, like SWFSC (2017), discussed above in section ST-3 Action. This Plan would adaptively manage new genetic and other stock information to ensure that truly viable populations of the target species are established (Lindley *et. al*., 2007). SWFSC (2017) notes that the	Lindley et al. (2007) appears to suggest that the upper Tuolumne River would be a poor candidate for a major restoration effort because temperatures in the upper Tuolumne River, even under the lowest of the expected climate change projections, "might just rise to the upper limit of the historical distribution of spring-run Chinook salmon". And this was using as a metric of allowable temperature suitability a mean summer air temperature of 25°C.

No	Citation	Pg No.	Full Reference	Context of Citation	Analysis
				ancestral *O. mykiss* genetics is still viable upstream of Don Pedro Reservoir and below La Grange Dam."	
138.	Lindley *et. al*., 2007	45	[provided above]	**NMFS states: "Rationale:** The Fish Passage Pilot Program is a critical link between measures in the new Licenses for the Projects and both the Short-term Fish Passage Plan and the Long-term Fish Passage Plan. The Fish Passage Pilot Program will provide a blueprint for obtaining critical information regarding types of facilities and the potential successful reintroduction of the target species into historical habitats upstream of Don Pedro Reservoir. Possible reintroduction strategies, methods, and facilities can be tested, adaptively managed, and refined to ensure that the long-term reintroduction of the target species results in increased spatial distributions and the establishment of viable populations (Lindley *et. al*., 2007)."	Lindley et al. (2007) appears to suggest that the upper Tuolumne River would be a poor candidate for a major restoration effort because temperatures in the upper Tuolumne River, even under the lowest of the expected climate change projections, "might just rise to the upper limit of the historical distribution of spring-run Chinook salmon". And this was using as a metric of allowable temperature suitability a mean summer air temperature of 25°C.
139.	NMFS (2014d)	46	[provided above]	**NMFS states: "Rationale:** The extent to which habitats above Central Valley dams can be successfully utilized for anadromous fish survival and production has been extensively analyzed in NMFS (2014d)."	As related to the upper Tuolumne River, this is simply not the case, which is why NMFS requested the Districts conduct a suite of habitat studies during the Don Pedro and La Grange licensing processes and under its Section 10(j) recommendations as filed on January 29, 2018.
140.	NMFS 2014d	50-51	[provided above]	NMFS states: "To assist in the efficacy of recovering the listed fish in the Central Valley, NMFS developed a (NMFS 2014d) Recovery Plan to serve as a road map for a conservation strategy to recover the listed CV salmonids. NMFS (2014d) Recovery Plan identifies the Projects' dams on the Tuolumne River as blocking access to habitat historically used by Tuolumne River CCV steelhead and CV Chinook salmon. NMFS (2014d) Recovery Plan identifies the upper Tuolumne River above Don Pedro Reservoir as a candidate area for reintroduction for the DPS of CCV steelhead and the ESU of CV spring-run Chinook salmon to further the recovery of these species through fish passage, which includes upstream passage of adults and downstream movement of juveniles past the dams."	The Districts have commented above as to what the NMFS Recovery Plan actually states. NMFS misstates, or does not faithfully state, the classification of the Tuolumne River contained in the Recovery Plan.
141.	Daniels *et al*. 2012		Daniels, A.E.; Morrison, J.F.; Joyce, L.A.; Crookston, N.L.; Chen, S.C.; McNulty, S.G. 2012. Climate projections FAQ. Gen. Tech. Rep. RMRS-GTR-277WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 32 p.	NMFS states: In general, NMFS (2014d) Recovery Plan (Section 6, pages 345-360) explains in detail the difficulty of managing cold water anadromous salmonids below impassable barriers, depending entirely on a fluctuating and often inadequate cold water reservoir pool. The analysis shows that even after all discretionary actions are taken to operate the Project reservoirs to reduce adverse effects of water operations on listed anadromous salmonids, the risk of temperature-related mortality of fish and eggs persists, especially in critically dry years. This mortality can be significant at the population level. The analysis also leads us to conclude that due to climate change, the frequency of these years will increase (Daniels	The NMFS Recovery Plan contains no specific analysis of the lower Tuolumne River temperature suitability. It is not clear exactly what "analysis" of the "Project reservoirs" NMFS is referring to. NMFS references "population level" impacts that may be significant, but offers no data or analysis of the population effects of the Districts' proposed flow and non-flow measures.

No	Citation	Pg No.	Full Reference	Context of Citation	Analysis
				et al. 2012).”	
142.	Lindley *et. al*., 2006	51	[provided above]	NMFS states: “Substantial areas of high quality habitat exist upstream of Don Pedro Reservoir and there are many miles of salmonid habitat available in the upper Tuolumne River, including the main stem and tributaries (Lindley *et. al*., 2006). These areas of suitable habitat will provide a refuge for cold water fish in the face of climate change (Dettinger *et al*. 2004; NMFS 2014d). There are many ways that the Districts could design and implement a Fish Passage Program Plan.”	Citing to Lindley et al. (2006) as concluding that “substantial areas of high quality habitat exist upstream of Don Pedro Reservoir..” is an unsupported and unjustified amplification of Lindley et al. (2006), which evaluated potential population structure of *O. mykiss* covering almost the entire state of California. In addition, Lindley et al. (2006) applied a temperature metric for oversummering temperature suitability far greater than the EPA (2003) metric NMFS advocates for *O. mykiss* in the Tuolumne River.
143.	Lindley *et al*. 2007		[provided above]	NMFS states: “NMFS is opposed to the Districts' proposed Chinook Salmon Fish Hatchery because it would prevent salmon populations from being truly viable (Lindley *et al*. 2004; 2006; 2007).”	Under the Lindley et al. (2007) criteria for assessing the risk of extinction, as reported in Table 1 of that report, the existing Tuolumne River fall-run Chinook population may already be at a “high” risk of extinction due to hatchery influence.
144.	Lindley *et al*. 2006, 2007	51	[provided above]	NMFS states: “Increased viability in salmonid populations is directly correlated with better flows, better habitat, and with low fish hatchery influences (Lindley *et al*. 2004; 2006; 2007; Mesick 2010a;c; McElhany *et al*. 2000;2003).”	Lindley et al. (2006; 2007) have been discussed previously above, and use of these cites here lacks relevance, except as possibly referring to Table 1 of Lindley et al. (2007) which points out the preference for low hatchery influence.
145.	Mesick 2010a		Mesick, C. 2010a. Instream Flow Recommendations For The Stanislaus, Tuolumne, and Merced Rivers to Maintain the Viability of the fall-run Chinook Salmon Populations. Prepared for CSPA by Carl Mesick Consultants, El Dorado, California. February 14, 2010. 29pp.		Mesick (2010a) provides a set of “recommended flows” in the lower Tuolumne River but without any description of the data or analysis used to derive the suggested flows. In fact, studies conducted during the ILP demonstrate the suggested winter flows would be more likely to have an adverse impact on fall-run Chinook and *O. mykiss* fry by displacing them to lower in the Tuolumne River and into the lower San Joaquin River where non-native predators are abundant. Also, see the Districts' Otolith study: TID/MID 2016, W&AR-11.
146.	Mesick 2010c		Mesick, C. 2010c. The high risk of extinction for the natural fall-run Chinook salmon population in the lower Merced river due to insufficient instream flow releases. Prepared by Carl Mesick Consultants for California Sportfish Protection Alliance.		Mesick (2010c) deals with the Merced River, not the Tuolumne River. Instream flow releases of the two rivers – Merced and Tuolumne – are substantially different; therefore reliance on Mesick (2010c) is misplaced.
147.	McElhany *et al*. 2000	51	McElhany, P., Ruckelshaus, M.H., Ford, M.J., Wainwright, T.C., and Bjorkstedt, E.P. 2000. Viable Salmonid Populations and the Conservation of Evolutionarily Significant Units. U.S. Department of Commerce, NOAA Technical Memorandum, NMFS-NWFSC-42. Seattle, Washington.		McElhany et al. (2000) reports on the general criteria for viable population of salmonid populations. The Tuolumne River is not discussed. No specific conclusions related to the Tuolumne River are made.
148.	USFWS 2014	51	USFWS. 2014. Identification of the Instream Flow Requirements for Anadromous fish in the Streams within the Central Valley of California and Fisheries Investigations - Annual Progress Report Fiscal year 2014. USFWS, Sacramento, CA.	NMFS states: “Research on the Tuolumne River (USFWS 2014; Mesick 2008; 2010a) has shown a significant correlation between floodplain activation and in-river survival of juvenile salmonids. Floodplain activation flows to allow juvenile salmonids to avoid exposure to predators and has the added benefit of providing food for juvenile salmonid growth—allowing them to avoid predation.	USFWS (2014) provides comments on the Districts' Floodplain Hydraulic Study. The Districts are commenting on the USFWS' “significant correlation” and floodplain analysis in a separate section to this May 14, 2018 filing with FERC (see section 7.0, and Attachments T and U).
149.	Mesick 2008	51	[provided above]		Mesick (2008) states the following: “The Tuolumne River's naturally produced fall-run Chinook

No	Citation	Pg No.	Full Reference	Context of Citation	Analysis
				Removal of predator habitat by filling in the deep-water pools to reduce predator fields and hot spots could significantly reduce predator abundance in the Tuolumne River and would not require direct removal of predators."	salmon population was judged to be at a high risk of extinction since 1990 because escapement has repeatedly declined to low levels, the population has declined rapidly, ***and the mean percentage of hatchery fish in the escapement has been high.*** [emphasis added]. It is also worth noting that the Districts attempted to reproduce the analysis contained in Mesick (2008), and made a Public Records Act request to CDFW for the raw data needed to confirm the analysis. CDFW's response to the PRA request did not contain the requested data and after numerous attempts at clarification, the data could not be located by CDFW. Reports which cannot be reproduced, or for which the underlying data cannot be located or provided should not be used to inform license conditions.

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