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UNITED STATES DISTRICT COURT  
FOR THE EASTERN DISTRICT OF CALIFORNIA

DELTA SMELT CONSOLIDATED CASES	1:09-cv-00407 OWW DLB
SAN LUIS & DELTA-MENDOTA WATER AUTHORITY, <i>et al.</i> v. SALAZAR, <i>et al.</i> (1:09-cv-00407 OWW DLB)	1:09-cv-00480-OWW-GSA 1:09-cv-00422-OWW-GSA 1:09-cv-00631-OWW-DLB 1:09-cv-00892-OWW-DLB
STATE WATER CONTRACTORS v. SALAZAR, <i>et al.</i> (1:09-cv-00480-OWW-GSA)	PARTIALLY CONSOLIDATED WITH: 1:09-CV-01201-OWW-DLB
COALITION FOR A SUSTAINABLE DELTA, <i>et al.</i> v. UNITED STATES FISH AND WILDLIFE SERVICE, <i>et al.</i> (1:09-cv-00422-OWW-GSA)	MEMORANDUM DECISION RE CROSS MOTIONS FOR SUMMARY JUDGMENT (DOCS. 548, 549, 550, 658, & 661)
METROPOLITAN WATER DISTRICT v. UNITED STATES FISH AND WILDLIFE SERVICE, <i>et al.</i> (1:09-cv-00631-OWW-DLB)	
STEWART & JASPER ORCHARDS <i>et al.</i> v. UNITED STATES FISH AND WILDLIFE SERVICE (1:09-cv-00892-OWW-DLB)	
FAMILY FARM ALLIANCE v. SALAZAR, <i>et al.</i> (1:09-CV-01201-OWW-DLB)	

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1  
2 I. INTRODUCTION

3 These consolidated cases arise out of the continuing war  
4 over protection of the delta smelt (*Hypomesus transpacificus*), an  
5 ESA-threatened species, and associated impacts to the water  
6 supply for more than half of the State of California.

7 Plaintiffs, San Luis & Delta Mendota Water Authority ("SLDMWD")  
8 and Westlands Water District, Metropolitan Water District of  
9 Southern California, State Water Contractors ("SWC"), Coalition  
10 for a Sustainable Delta and Kern County Water Agency, Stewart &  
11 Jasper Orchards, Arroyo Farms, LLC, and King Pistacho Grove, and  
12 Family Farm Alliance, move for summary judgment on their numerous  
13 remaining claims against the United States Fish and Wildlife  
14 Service's ("FWS") December 15, 2008 Biological Opinion addressing  
15 the impacts of the coordinated operations of the federal Central  
16 Valley Project ("CVP") and State Water Project ("SWP") on the  
17 threatened delta smelt (*Hypomesus transpacificus*). Doc. 550.

18 Plaintiff-in-Intervention, the California Department of Water  
19 Resources ("DWR") filed a separate motion for summary judgment on  
20 narrower grounds. Docs. 548 & 549. Federal Defendants, the  
21 United States Department of the Interior, FWS, and the United  
22 States Bureau of Reclamation ("Reclamation"), and Defendant  
23 Intervenor, Natural Resources Defense Council and The Bay  
24 Institute, oppose and cross move for summary judgment on all  
25 remaining claims. Docs. 658 & 661. Plaintiffs and DWR replied.  
26  
27  
28

1 Docs. 697 & 695. The motion came on for hearing on July 8 & 9,  
2 2010. After oral argument, the parties submitted supplemental  
3 briefing on a limited set of issues. Docs. 746-49.  
4

5 II. PROCEDURAL HISTORY

6 FWS's 2005 biological opinion ("2005 Smelt BiOp") found that  
7 the proposed coordinated operations of the SWP and CVP will have  
8 no adverse effect on the continued existence and recovery of the  
9 Delta Smelt and its critical habitat. The 2005 BiOp was remanded  
10 to FWS as arbitrary and capricious. Order, *NRDC v. Kempthorne*,  
11 1:05-cv-1207 (E.D. Cal. May 25, 2007), Doc. 323. Following an  
12 extensive evidentiary hearing, the Court issued an interim  
13 remedial order and Findings of Fact and Conclusions of Law  
14 ("Findings"), which covered, among other things, the effects on  
15 delta smelt of negative flows in Old and Middle Rivers ("OMR"),  
16 two distributary channels of the San Joaquin River. See Interim  
17 Remedial Order Following Summary Judgment and Evidentiary Hearing  
18 ("Int. Rem. Order"), *NRDC v. Kempthorne*, Doc. 560 (Dec. 14,  
19 2007); Findings re: Delta Smelt ESA Remand and Reconsultation  
20 ("Int. Rem. Findings"), *NRDC v. Kempthorne*, Doc. 561 (Dec. 14,  
21 2007).<sup>1</sup>  
22  
23

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24  
25 <sup>1</sup> There is limited merit to Plaintiffs' contention that these prior  
26 findings are "not relevant." See Doc. 551 at 91. These findings are not  
27 dispositive, but cannot be ignored, as they are based on extensive scientific  
28 testimony subject to cross-examination by many of the Plaintiffs in the  
present case. The order remanded the 2005 BiOp back to FWS "for further  
consideration consistent with [the] Court's orders and the requirements of  
law." Int. Rem. Order at 2 (emphasis added).

1 Reclamation and DWR were ordered, among other things, to  
2 implement a winter "pulse flow" in OMR of no more negative than -  
3 2,000 cubic feet per second ("cfs"), and to "operate the CVP and  
4 SWP to achieve a daily average net upstream (reverse) flow in the  
5 OMR not to exceed 5,000 cfs on a seven-day running average"  
6 during a defined period in the spring. Int. Rem. Order at 5-7;  
7 see also Int. Rem. Findings at 15-20.

9 FWS issued a new delta smelt biological opinion on December  
10 15, 2008 ("2008 Smelt BiOp" or "BiOp"). See Administrative  
11 Record ("AR") at 00001-00411.<sup>2</sup> This BiOp concluded that proposed  
12 CVP and SWP operations are "likely to jeopardize the continued  
13 existence of" the delta smelt and "adversely modify" its critical  
14 habitat. BiOp at 276-79. The BiOp includes a required  
15 Reasonable and Prudent Alternative ("RPA") designed to allow the  
16 projects' continued operations without causing jeopardy to the  
17 species or adverse modification to its critical habitat. *Id.* at  
18 279-85. The RPA includes operational components designed to  
19 reduce entrainment of smelt during critical times of the year by  
20 controlling (limiting) water exports from the Delta by the  
21 Projects. *Id.* at 279-85.

22  
23  
24 Component 1, to protect of the adult delta smelt life stage,  
25 consists of two Actions related to OMR flows.

---

26  
27  
28 <sup>2</sup> Citations to the 2008 delta smelt BiOp will be to the BiOp's original  
pagination, not Administrative Record page numbers.

1       • Action 1, to protect upmigrating delta smelt, is triggered  
2       during low and high entrainment risk periods based on  
3       physical and biological monitoring. Action 1 requires OMR  
4       flows to be no more negative than -2,000 cfs on a 14-day  
5       average and no more negative than -2,500 cfs for a 5-day  
6       running average. *Id.* at 280-82, 329-51.  
7  
8       • Action 2, to protect adult delta smelt that have migrated  
9       upstream and are present in the Delta prior to spawning.  
10      Action 2 is triggered immediately after Action 1 concludes  
11      or if recommended by the Smelt Working Group ("SWG"). Flows  
12      under Action 2 can be set within a range from -5,000 to  
13      -1,250 cfs, depending on a complex set of biological and  
14      environmental parameters. *Id.* at 281-82, 352-56.  
15  
16      Component 2 (Action 3), to protect larval and juvenile delta  
17      smelt, requires OMR flows to be kept between -1,250 and -5,000  
18      cfs, after Component 1 is completed, when Delta water  
19      temperatures reach 12° Celcius ("C"), or when a spent female  
20      smelt is detected in trawls or at salvage<sup>3</sup> facilities. *Id.* at  
21      282, 357-58. Component 2 continues until June 30 or when the  
22      Clifton Court Forebay water temperature reaches 25° C. *Id.* at  
23      282, 368.  
24

---

25  
26       <sup>3</sup> It is undisputed that Project pumping "kills Delta smelt by sucking  
27      them directly into the pumps; by drawing them into fish 'salvage' facilities  
28      which collect fish diverted from entering the pumps, a process that kills the  
    smelt; and drawing smelt into the SWP's Clifton Court Forebay from which the  
    fish cannot escape and where they will die even if they are not drawn into the  
    salvage facilities or the pumps." Int. Rem. Findings ¶ 19.



1           Component 3 (Action 4), to improve habitat for delta smelt  
2 growth and rearing, requires sufficient Delta outflow to maintain  
3 average mixing point locations of Delta outflow and estuarine  
4 water inflow ("X2"<sup>4</sup>) from September to December, depending on  
5 water year type, in accordance with a specifically described  
6 "adaptive management process" overseen by FWS. *Id.* at 282-83,  
7 369.<sup>5</sup>  
8

9           Component 4 (Action 6) (Habitat Restoration), requires DWR  
10 to create or restore 8,000 acres of intertidal and subtidal  
11 habitat in the Delta and Suisun Marsh within 10 years. *Id.* at  
12 283-84, 379.  
13

14           Component 5 (Monitoring and Reporting), requires Reclamation  
15 and DWR to gather and report information to ensure proper  
16 implementation of the RPA actions, achievement of physical  
17 results, and evaluation of the effectiveness of the actions on  
18 the targeted life stages of delta smelt, so that the actions can  
19 be refined, if needed. *Id.* at 284-85, 328, 375.  
20

21           The first of the six consolidated challenges to the BiOp was  
22 filed on March 3, 2009. Doc. 1. Plaintiffs moved for a  
23

---

24           <sup>4</sup> X2 is the location in the Delta where the salinity is two parts per  
25 thousand, measured as the distance upstream from the Golden Gate.  
*Consolidated Delta Smelt Cases*, 717 F. Supp. 2d 1021, 1029 (E.D. Cal. May 27,  
2010); BiOp at 149.

26           <sup>5</sup> Action 5, which is not formally associated with any "Component" of the  
27 RPA, prohibits FWS from installing the Head of Old River Barrier, a physical  
28 barrier designed to reduce the number of out-migrating salmon smolts entering  
Old River, in the spring if delta smelt entrainment triggers are met. BiOp at  
175, 377-78.

1 preliminary injunction on April 24, 2009 to prevent Reclamation  
2 from implementing Component 2 of the RPA, alleging that FWS  
3 violated the National Environmental Policy Act ("NEPA") and the  
4 ESA. See Doc. 31.

5 On May 22, 2009, the Court granted that motion in part,  
6 finding that Plaintiffs were likely to succeed on the merits of  
7 their NEPA claim and requiring FWS to make specific written  
8 findings to justify OMR flow restrictions. See Doc. 84; see also  
9 Doc. 94, Findings re Mot. for Prelim. Inj. (May 29, 2009).  
10 Defendants complied with that Order, submitting weekly notices of  
11 FWS's OMR flow decisions. See, e.g., Doc. 111, Notice of OMR  
12 Flow Decision (June 11, 2009). The Court's May 2009 preliminary  
13 injunction ruling was not based on Plaintiffs' ESA claims. Doc.  
14 94 at 43.  
15  
16

17 Plaintiffs amended their Complaint, joined and added claims  
18 against Reclamation, see Doc. 292, and moved for summary judgment  
19 on their NEPA claim, see Doc. 245. A November 13, 2009, ruling  
20 granted summary adjudication in part, based on Reclamation's  
21 failure to prepare an environmental impact statement before  
22 provisionally accepting and implementing the BiOp and its RPA  
23 Actions. Doc. 399.  
24

25 Summary judgment for Defendants was granted on: (1) Stewart  
26 and Jasper Orchards' Commerce Clause claim that the ESA did not  
27 apply to protect delta smelt, a purely intra-state species, Doc.  
28

1 339; and (2) claims that the BiOp violated regulations governing  
2 formulation of the RPA by not including required information in  
3 the BiOp text, Doc. 354.

4 Plaintiffs then filed three temporary restraining order  
5 motions over a six week period -- all of which were denied. See  
6 Docs. 555 & 583; see also 3/16/10 Hrg. Tr. at 86-88. Plaintiffs  
7 next sought a preliminary injunction against implementation of  
8 RPA Component 3. An evidentiary hearing was held from April 2,  
9 2010 through April 7, 2010. Docs. 644, 652-54. Findings Re  
10 Plaintiffs' Request for Preliminary Injunction issued May 27,  
11 2010 ("PI Decision"). Doc. 704. The PI Decision confirmed  
12 Plaintiffs had succeeded on their NEPA claim and found Plaintiffs  
13 were likely to succeed on the merits of their ESA claim:  
14  
15

16 Although the premise underlying Component 2 -- that the  
17 species may be jeopardized by increased negative flows  
18 occasioned by export pumping -- has record support, FWS  
19 has failed to adequately justify by generally  
20 recognized scientific principles the precise flow  
21 prescriptions imposed by Component 2. The exact  
22 restrictions imposed, which are inflicting material  
23 harm to humans and the human environment, are not  
24 supported by the record, making it impossible to  
25 determine whether RPA Component 2 [is] overly  
26 protective. Judicial deference is not owed to  
27 arbitrary, capricious, and scientifically unreasonable  
28 agency action.

24 *Id.* at 122. Plaintiffs presented evidence under NEPA on the  
25 balance of the hardships that social dislocation, unemployment,  
26 and other threats to human health and safety were caused by  
27 interdiction of Plaintiffs' water supply. See *id.* at 123.

1 Countervailing irreparable harm was found, because "the species  
2 and its critical habitat[] are entitled to protection under the  
3 ESA." *Id.* at 124. Acknowledging the existence of legal and  
4 equitable grounds for injunctive relief, further evidence was  
5 requested on the "status of the species to assure that altered  
6 operations will not deepen jeopardy to the affected species or  
7 otherwise violate other laws." *Id.* at 125. Specifically, to  
8 establish "that Plaintiffs' proposed remedy of a flat -5,600 cfs  
9 ceiling on negative OMR flows will not jeopardize the continued  
10 existence of the species and/or adversely modify its critical  
11 habitat." *Id.*

12  
13 A May 28, 2010 status conference sought to determine whether  
14 a mutually-agreeable interim operational plan could be  
15 implemented. Doc. 706. On June 22, 2010, the parties stipulated  
16 to a joint operational plan to maintain OMR flows so as not to be  
17 more negative than -5,000 cfs, unless certain, defined salvage  
18 triggers required a further reduction in OMR flows. Doc. 724.

19  
20 After these dispositive motions were filed, the National  
21 Academy of Sciences, completed a comprehensive review of the  
22 BiOp, and concluded that the BiOp and the RPA Actions were  
23 "scientifically justified." See National Academy of Sciences,  
24 National Research Council, A Scientific Assessment of  
25 Alternatives for Reducing Water Management Effects on Threatened  
26 and Endangered Fishes in California's Bay Delta at 3. Doc. 635.

1 This post-decisional document is not part of the Administrative  
2 Record ("AR") and no legal justification exists to supplement the  
3 AR to include it.

4 Additionally, a scientific peer review panel was convened by  
5 the private consulting firm, Post Buckley Shuh and Jernigan  
6 ("PBS&J"), at the request of Plaintiff Family Farm Alliance  
7 ("FFA") in connection with FFA's administrative petition under  
8 the Information Quality Act ("IQA"). See *Family Farm Alliance v.*  
9 *Salazar*, 09-cv-1201 OWW-DLB (E.D. Cal.), Doc. 27, Ex. A. This  
10 document is part of the administrative record in the *Family Farm*  
11 *Alliance IQA* case, not the smelt AR. There is no basis to  
12 consider this document for non-IQA claims.  
13  
14

### 15 III. STATUS OF THE SPECIES

16 The delta smelt was listed as a threatened species under the  
17 ESA on March 5, 1993. 58 Fed. Reg. 12,854 (March 5, 1993).  
18 Critical habitat was designated for the delta smelt on December  
19 19, 1994. 59 Fed. Reg. 65,256 (Dec. 19, 1994). Once an abundant  
20 species in the Bay-Delta ecosystem as recently as thirty years  
21 ago, the delta smelt is now in imminent danger of extinction. PI  
22 Decision, Finding of Fact ¶ 10. All the evidence shows a  
23 significant decline in smelt abundance since 2000, recently up to  
24 three orders of magnitude below historic lows. *Id.* The latest  
25 fall mid-water trawl ("FMWT") abundance index for the species was  
26 17, the lowest level ever recorded. *Id.*  
27  
28

1 On April 7, 2010, FWS announced that reclassifying the delta  
2 smelt from a threatened to an endangered species was warranted,  
3 but precluded by higher priority listing actions. 75 Fed. Reg.  
4 17,667 (Apr. 7, 2010). The direct mortality of delta smelt by  
5 entrainment at the CVP-SWP pumps, as well as the destruction and  
6 adverse modification of its habitat in the Delta caused by water  
7 exports, were important factors in this determination. *Id.* at  
8 17,669, 17,671 ("The operation of State and Federal export  
9 facilities constitute a significant and ongoing threat to delta  
10 smelt through direct mortality by entrainment"). As a result of  
11 the "immediate and high magnitude threats" confronting the  
12 species, the delta smelt was assigned a listing priority number  
13 of 2.<sup>6</sup> *Id.* at 17,675.

16 IV. SUMMARY OF MOTION

17 A. Plaintiffs' Motion.

18 Plaintiffs' motion advances the following grounds and  
19 contentions:

- 20 (1) FWS failed to rely on the "best available science" by  
21 making fundamental scientific errors in its analysis of  
22 the impacts of Project Operations on the species by:  
23 (a) Relying on raw salvage numbers in quantitative  
24 impact analyses;  
25

---

26  
27  
28 <sup>6</sup> "Warranted but precluded" species are assigned listing priority numbers from 1 to 12, with 1 being the highest priority. *Id.* at 17,674.

- 1 (b) Failing to conduct a life cycle analysis;
- 2 (c) Comparing the results of two entirely different,
- 3 incompatible flow and salinity models; and
- 4 (d) Selectively excluding certain data for one
- 5 purpose, but then unjustifiably using it for
- 6 another;
- 7

8 (2) The BiOp's Project Effects Analysis is arbitrary and

9 capricious because FWS:

- 10 (a) Assumed that Project operations drive hydrological
- 11 conditions in the Delta and did not explain or
- 12 justify this attribution;
- 13 (b) Evaluated the impacts of other (i.e., non-Project)
- 14 stressors erroneously and inconsistently; and
- 15 (c) Improperly characterized summer food supply
- 16 suppression, invasive species, and pollution and
- 17 contaminants as indirect effects of Project
- 18 Operations;
- 19

20 (3) The BiOp is arbitrary and capricious because it does

21 not distinguish between discretionary and

22 nondiscretionary actions, improperly inflating the

23 alleged effects of Project Operations;

24

25 (4) The BiOp's RPA is unlawful because FWS did not conduct

26 the specific analyses required by the ESA and FWS' own

27 RPA regulation, 50 C.F.R. § 402.02, because neither the

28

- 1                   BiOp nor the AR demonstrate that FWS analyzed or  
2                   applied the first three (of four) § 402.02 factors;  
3                   (5) FWS illegally arrogated to itself Project operating  
4                   authority in derogation of Reclamation and DWR;  
5                   (6) FWS acted arbitrarily and capriciously by disregarding  
6                   the Information Quality Act ("IQA") when preparing and  
7                   issuing the BiOp;  
8                   (7) FWS violated NEPA by not considering the environmental  
9                   impacts of issuing the BiOp and RPA.  
10                   (8) Reclamation violated its legal duties by accepting FWS'  
11                   inherently flawed BiOp.  
12

13  
14       B.    DWR's Motion.

15       DWR's attacks three aspects of the BiOp:

- 16       (1) By relying on a comparison of CALSIM II model runs with  
17       what the BiOp terms "historic" data (which was actually  
18       generated by the Dayflow model), the BiOp's analysis of  
19       the effects of the proposed action on smelt habitat  
20       does not yield meaningful information and violates the  
21       ESA's best available science requirement. This  
22       analysis further violates the APA because FWS did not  
23       adequately articulate any rational connection between  
24       the facts found based on these comparisons, and its  
25       conclusions regarding the Projects' effects on the  
26       smelt.  
27  
28



1 (2) Component 3 of the RPA, also referred to in the BiOp as  
2 Action 4, is intended to mitigate the effects of the  
3 proposed action on smelt habitat, by requiring the  
4 Projects to maintain X2 in specified locations,  
5 depending on the type of water year. The BiOp,  
6 however, lacks sufficient explanation as to the basis  
7 for the specific prescriptions imposed by this  
8 Component, in violation of the APA. Moreover, to the  
9 extent that the record reveals that these prescriptions  
10 are based, even in part, on the methods used in the  
11 effects analysis, they violate the ESA's "best  
12 available science" mandate.  
13

14 (3) The Incidental Take Statement ("ITS") is defective.  
15 First, its estimates are based on the average take from  
16 water years 2006 through 2008, which predicts the ITS  
17 will likely be exceeded in half of all years. Second,  
18 FWS erroneously misapplied its own data with the result  
19 that the BiOp claims that the ITS was only exceeded in  
20 five of the previous sixteen years, rather than  
21 accurately stating that it was exceeded in eleven of  
22 the sixteen years. Third, the ITS take estimate is  
23 based on a data sample that is too small to provide a  
24 reasonable prediction of take under the RPA. These  
25 defects violate the ESA's "best available science"  
26  
27  
28

1 requirement, the ESA's ITS requirements, and the APA.

2  
3 V. STANDARD OF DECISION

4 Summary judgment is appropriate when the pleadings and the  
5 record demonstrate that "there is no genuine dispute as to any  
6 material fact and that the moving party is entitled to judgment  
7 as a matter of law." Fed. R. Civ. P. 56(c). The claims in this  
8 case involve FWS's issuance of a biological opinion, which is a  
9 final agency action subject to judicial review under the APA, 5  
10 U.S.C. § 702. *Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries*  
11 *Serv.*, 524 F.3d 917, 925 (9th Cir. 2008) ("*NWF v. NMFS II*"). A  
12 court conducting judicial review under the APA may not resolve  
13 factual questions, but instead determines "whether or not as a  
14 matter of law the evidence in the administrative record permitted  
15 the agency to make the decision it did." *Sierra Club v.*  
16 *Mainella*, 459 F. Supp. 2d 76, 90 (D.D.C. 2006) (quoting  
17 *Occidental Eng'g Co. v. INS*, 753 F.2d 766, 769 (9th Cir. 1985)).  
18 "[I]n a case involving review of a final agency action under the  
19 [APA] ... the standard set forth in Rule 56(c) does not apply  
20 because of the limited role of a court in reviewing the  
21 administrative record." *Id.* at 89. In this context, summary  
22 judgment becomes the "mechanism for deciding, as a matter of law,  
23 whether the agency action is supported by the administrative  
24 record and otherwise consistent with the APA standard of review."  
25 *Id.* at 90.

1 VI. BASIC LEGAL FRAMEWORK

2 A. Review under the APA.

3 Administrative Procedure Act ("APA") invalidation of a  
4 biological opinion requires Plaintiffs to prove that FWS's action  
5 was "arbitrary, capricious, an abuse of discretion, or otherwise  
6 not in accordance with law." 5 U.S.C. § 706(2) (A).  
7

8 (1) Record Review.

9 APA review of a biological opinion is "based upon the  
10 evidence contained in the administrative record." *Arizona Cattle*  
11 *Growers' Ass'n v. FWS*, 273 F.3d 1229, 1245 (9th Cir. 2001).  
12 Judicial review under the APA must focus on the administrative  
13 record already in existence, not some new record made initially  
14 in a reviewing court. Parties may not use "post-decision  
15 information as a new rationalization either for sustaining or  
16 attacking the agency's decision." *Ass'n of Pac. Fisheries v.*  
17 *EPA*, 615 F.2d 794, 811-12 (9th Cir. 1980). Exceptions to  
18 administrative record review for technical information or expert  
19 explanation make such evidence admissible only for limited  
20 purposes, and those exceptions are narrowly construed and  
21 applied. *Lands Council v. Powell*, 395 F.3d 1019, 1030 (9th Cir.  
22 2005).  
23  
24

25 Here, as evidentiary rulings explained, see, e.g., Docs.  
26 387, 392 (10/19/09 Hrg. Tr), 406, 407, 462, 740 (7/8/10 Hrg.),  
27 750, expert testimony has been considered only for explanation of  
28

1 technical terms and complex scientific subject matter beyond the  
2 Court's knowledge; and to understand the agency's explanations,  
3 or lack thereof, and the parties' arguments.  
4

5 (2) Deference to Agency Expertise.

6 A Court must defer to the agency on matters within the  
7 agency's expertise, unless the agency completely failed to  
8 address some factor, consideration of which was essential to  
9 making an informed decision. *Nat'l Wildlife Fed'n v. Nat'l*  
10 *Marine Fisheries Serv.*, 422 F.3d 782, 798 (9th Cir. 2005) ("*NWF*  
11 *v. NMFS I*"). A court "may not substitute its judgment for that  
12 of the agency concerning the wisdom or prudence of the agency's  
13 action." *River Runners for Wilderness v. Martin*, 593 F.3d 1064,  
14 1070 (9th Cir. 2009):  
15

16 In conducting an APA review, the court must determine  
17 whether the agency's decision is "founded on a rational  
18 connection between the facts found and the choices made  
19 ... and whether [the agency] has committed a clear  
20 error of judgment." *Ariz. Cattle Growers' Ass'n v.*  
21 *U.S. Fish & Wildlife*, 273 F.3d 1229, 1243 (9th Cir.  
22 2001). "The [agency's] action ... need be only a  
23 reasonable, not the best or most reasonable, decision."  
24 *Nat'l Wildlife Fed. v. Burford*, 871 F.2d 849, 855 (9th  
25 Cir. 1989).

26 *Id.*

27 Although deferential, judicial review under the APA is  
28 designed to "ensure that the agency considered all of the  
relevant factors and that its decision contained no clear error  
of judgment." *Arizona v. Thomas*, 824 F.2d 745, 748 (9th Cir.  
1987) (internal citations omitted). "The deference accorded an

1 agency's scientific or technical expertise is not unlimited."  
2 *Brower v. Evans*, 257 F.3d 1058, 1067 (9th Cir. 2001) (internal  
3 citations omitted).

4 [An agency's decision is] arbitrary and capricious if  
5 [it] has relied on factors which Congress has not  
6 intended it to consider, entirely failed to consider an  
7 important aspect of the problem, offered an explanation  
8 for its decision that runs counter to the evidence  
before the agency, or is so implausible that it could  
not be ascribed to a difference in view or the product  
of agency expertise.

9 *Motor Vehicle Mfrs. Ass'n of U.S. v. State Farm Mut. Auto. Ins.*  
10 *Co.*, 463 U.S. 29, 43 (1983); see also *Citizens to Preserve*  
11 *Overton Park, Inc. v. Volpe*, 401 U.S. 402, 416 (1971) (reviewing  
12 court may overturn an agency's action as arbitrary and capricious  
13 if the agency failed to consider relevant factors, failed to base  
14 its decision on those factors, and/or made a "clear error of  
15 judgment"), *overruled on other grounds by Califano v. Sanders*,  
16 430 U.S. 99, 105 (1977)).

18 More generally, "[u]nder the APA 'the agency must examine  
19 the relevant data and articulate a satisfactory explanation for  
20 its action including a rational connection between the facts  
21 found and the choice made.'" *Humane Soc. of U.S. v. Locke*, ---  
22 F.3d ---, 2010 WL 4723195, \*5 (9th Cir. 2010) (quoting *Motor*  
23 *Vehicle Mfrs. Ass'n*, 463 U.S. at 43). "The reviewing court  
24 should not attempt itself to make up for an agency's  
25 deficiencies: We may not supply a reasoned basis for the  
26 agency's action that the agency itself has not given." *Id.*

1           (3) General Obligations Under the ESA.

2           ESA Section 7(a)(2) prohibits agency action that is "likely  
3           to jeopardize the continued existence" of any endangered or  
4           threatened species or "result in the destruction or adverse  
5           modification" of its critical habitat. 16 U.S.C. § 1536(a)(2).

6           To "jeopardize the continued existence of" means "to engage  
7           in an action that reasonably would be expected, directly or  
8           indirectly, to reduce appreciably the likelihood of both the  
9           survival and recovery of a listed species in the wild by reducing  
10          the reproduction, numbers, or distribution of that species." 50  
11          C.F.R. § 402.02; see also *NWF v. NMFS II*, 524 F.3d 917 (rejecting  
12          agency interpretation of 50 C.F.R. § 402.02 that in effect  
13          limited jeopardy analysis to survival and did not realistically  
14          evaluate recovery, thereby avoiding an interpretation that reads  
15          the provision "and recovery" entirely out of the text). An  
16          action is "jeopardizing" if it keeps recovery "far out of reach,"  
17          even if the species is able to cling to survival. *NWF v. NMFS*  
18          *II*, 524 F.3d at 931. "[A]n agency may not take action that will  
19          tip a species from a state of precarious survival into a state of  
20          likely extinction. Likewise, even where baseline conditions  
21          already jeopardize a species, an agency may not take action that  
22          deepens the jeopardy by causing additional harm." *Id.* at 930.

23          To satisfy this obligation, the federal agency undertaking  
24          the action (the "action agency") must prepare a "biological  
25          26          27          28

1 assessment" that evaluates the action's potential impacts on  
2 species and species' habitat. 16 U.S.C. § 1536(c); 50 C.F.R. §  
3 402.12(a). If the proposed action "is likely to adversely  
4 affect" a threatened or endangered species or adversely modify  
5 its designated critical habitat, the action agency must engage in  
6 "formal consultation" with FWS to obtain its biological opinion  
7 as to the impacts of the proposed action on the listed species.  
8 See 16 U.S.C. § 1536(a) (2), (b) (3); see also 50 C.F.R.  
9 § 402.14(a), (g). Once the consultation process has been  
10 completed, FWS must give the action agency a written biological  
11 opinion "setting forth [FWS's] opinion, and a summary of the  
12 information on which the opinion is based, detailing how the  
13 agency action affects the species or its critical habitat." 16  
14 U.S.C. § 1536(b) (3) (A); see also 50 C.F.R. § 402.14(h).

17 If FWS determines that jeopardy or destruction or adverse  
18 modification of critical habitat is likely, FWS "shall suggest  
19 those reasonable and prudent alternatives which [it] believes  
20 would not violate subsection (a) (2) of this section and can be  
21 taken by the Federal agency or applicant in implementing the  
22 agency action." 16 U.S.C. § 1536(b) (3) (A). "Following the  
23 issuance of a 'jeopardy' opinion, the agency must either  
24 terminate the action, implement the proposed alternative, or seek  
25 an exemption from the Cabinet-level Endangered Species Committee  
26 pursuant to 16 U.S.C. § 1536(e)." *Nat'l Ass'n of Home Builders*  
27  
28

1 v. *Defenders of Wildlife*, 551 U.S. 644, 652 (2008).

2  
3 (4) Best Available Science.

4 Under the ESA, an agency's actions must be based on "the  
5 best scientific and commercial data available." 16 U.S.C. §  
6 1536(a)(2); 50 C.F.R. § 402.14(g)(8) ("In formulating its  
7 Biological Opinion, any reasonable and prudent alternatives, and  
8 any reasonable and prudent measures, the Service will use the  
9 best scientific and commercial data available...."). A failure  
10 by the agency to utilize the best available science is arbitrary  
11 and capricious. See *Pac. Coast Fed'n of Fishermen's Assns. v.*  
12 *Gutierrez*, 606 F. Supp. 2d 1122, 1144 (E.D. Cal. 2008).

14 "The obvious purpose of the [best available science  
15 requirement] is to ensure that the ESA not be implemented  
16 haphazardly, on the basis of speculation or surmise." *Bennett v.*  
17 *Spear*, 520 U.S. 154, 176 (1997).

18 While this no doubt serves to advance the ESA's overall  
19 goal of species preservation, we think it readily  
20 apparent that another objective [of the best available  
21 science requirement] (if not indeed the primary one) is  
22 to avoid needless economic dislocation produced by  
23 agency officials zealously but unintelligently pursuing  
24 their environmental objectives. That economic  
25 consequences are an explicit concern of the ESA is  
26 evidenced by § 1536(h), which provides exemption from §  
27 1536(a)(2)'s no-jeopardy mandate where there are no  
28 reasonable and prudent alternatives to the agency  
action and the benefits of the agency action clearly  
outweigh the benefits of any alternatives. We believe  
the "best scientific and commercial data" provision is  
similarly intended, at least in part, to prevent  
uneconomic (because erroneous) jeopardy determinations.



1 *Id.* at 176-77.

2 A decision about jeopardy must be made based on the best  
3 science available at the time of the decision; the agency cannot  
4 wait for or promise future studies. See *Ctr. for Biological*  
5 *Diversity v. Rumsfeld*, 198 F. Supp. 2d 1139, 1156 (D. Ariz.  
6 2002). The "best available science" mandate of the ESA sets a  
7 basic standard that "prohibits the [agency] from disregarding  
8 available scientific evidence that is in some way better than the  
9 evidence [it] relies on." *Am. Wildlands v. Kempthorne*, 530 F.3d  
10 991, 998 (D.C. Cir. 2008) (citation omitted).

11  
12 What constitutes the "best" available science implicates  
13 core agency judgment and expertise to which Congress requires the  
14 courts to defer; a court should be especially wary of overturning  
15 such a determination on review. *Baltimore Gas & Elec. Co. v.*  
16 *Natural Res. Defense Council*, 462 U.S. 87, 103 (1983) (a court  
17 must be "at its most deferential" when an agency is "making  
18 predictions within its area of special expertise, at the  
19 frontiers of science"). As explained in the *en banc* decision in  
20 *Lands Council*, 537 F.3d at 993, courts may not "impose on the  
21 agency their own notion of which procedures are best or most  
22 likely to further some vague, undefined public good." In  
23 particular, an agency's "scientific methodology is owed  
24 substantial deference." *Gifford Pinchot Task Force v. U.S. Fish*  
25 *& Wildlife Serv.*, 378 F.3d 1059, 1066 (9th Cir. 2004).  
26  
27  
28

1           When specialists express conflicting views, an agency must  
2 have discretion to rely on the reasonable opinions of its own  
3 qualified experts even if, as an original matter, a court might  
4 find contrary views more persuasive." *Lands Council*, 537 F.3d at  
5 1000 (quoting *Marsh v. Oregon Natural Res. Council*, 490 U.S. 360,  
6 378 (1989)). Mere uncertainty, or the fact that evidence may be  
7 "weak," is not fatal to an agency decision. *Greenpeace Action v.*  
8 *Franklin*, 14 F.3d 1324, 1337 (9th Cir. 1992) (upholding  
9 biological opinion, despite uncertainty about the effectiveness  
10 of management measures, because decision was based on a  
11 reasonable evaluation of all available data); *Nat'l Wildlife*  
12 *Fed'n v. Babbitt*, 128 F. Supp. 2d 1274, 1300 (E.D. Cal. 2000)  
13 (holding that the "most reasonable" reading of the best  
14 scientific data available standard is that it "permits the [FWS]  
15 to take action based on imperfect data, so long as the data is  
16 the best available"). FWS "must utilize the 'best scientific ...  
17 data available,' not the best scientific data possible."  
18 *Building Indus. Ass'n v. Norton*, 247 F.3d 1241, 1246 (D.C. Cir.  
19 2001), cited with approval in *Kern County Farm Bureau v. Allen*,  
20 450 F.3d 1072, 1080-81 (9th Cir. 2006) ("Absent superior data  
21 occasional imperfections do not violate" the ESA best available  
22 data standard); see also *Defenders of Wildlife v. Babbitt*, 958 F.  
23 Supp. 670, 680 (D.D.C. 1997) (best available science standard  
24 does not require "conclusive evidence," only that agency use best  
25  
26  
27  
28

1 science available and not ignore contrary evidence).

2 The deference afforded under the best available science  
3 standard is not unlimited. For example, *Tucson Herpetological*  
4 *Society v. Salazar*, 566 F.3d 870, 879 (9th Cir. 2009), held that  
5 an agency may not rely on "ambiguous studies as evidence" to  
6 support findings made under the ESA. Because the studies did not  
7 lead to the conclusion reached by FWS, the Ninth Circuit held  
8 that these studies provided inadequate support in the  
9 administrative record for the determination made by FWS. *Id.*;  
10 see also *Rock Creek Alliance v. U.S. Fish & Wildlife Service*, 390  
11 F. Supp. 2d 993, 1008 (D. Mont. 2005) (rejecting FWS's reliance  
12 on a disputed scientific report, which explicitly stated its  
13 analysis was not applicable to the small populations addressed in  
14 the challenged opinion). Alternatively, the presumption of  
15 agency expertise may be rebutted if the agency's decisions,  
16 although based on scientific expertise, are not reasoned,  
17 *Greenpeace v. NMFS*, 80 F. Supp. 2d 1137, 1147 (W.D. Wash. 2000),  
18 or if the agency disregards available scientific evidence better  
19 than the evidence on which it relies, *Kern County Farm Bureau*,  
20 450 F.3d at 1080.

21 Courts routinely perform substantive reviews of record  
22 evidence to evaluate the agency's treatment of best available  
23 science. The judicial review process is not one of blind  
24 acceptance. See, e.g., *Kern County*, 450 F.3d at 1078-79  
25  
26  
27  
28

1 (thoroughly reviewing three post-comment studies and FWS's  
2 treatment of those studies to determine whether they "provide[d]  
3 the sole, essential support for" or "merely supplemented" the  
4 data used to support a listing decision); *Home Builders Ass'n of*  
5 *N. Cal. v. U.S. Fish and Wildlife Serv.*, 529 F. Supp. 2d 1110,  
6 1120 (N.D. Cal. 2007) (examining substance of challenge to FWS's  
7 determination that certain data should be disregarded); *Trout*  
8 *Unlimited v. Lohn*, 645 F. Supp. 2d 929 (D. Or. 2007) (finding  
9 best available science standard had been violated after thorough  
10 examination of rationale for NMFS's decision to withdraw its  
11 proposal to list Oregon Coast Coho salmon); *Oceana, Inc. v.*  
12 *Evans*, 384 F. Supp. 2d 203, 217-18 (D.D.C. 2005) (carefully  
13 considering scientific underpinnings of challenge to FWS's use of  
14 a particular model, including post decision evidence presented by  
15 an expert to help the court understand the complex model,  
16 applying one of several record review exceptions articulated in  
17 *Esch v. Yeutter*, 876 F.2d 976, 991 (D.C. Cir. 1989), which are  
18 similar to those articulated by the Ninth Circuit).

19  
20  
21 Courts are not required to defer to an agency conclusion  
22 that runs counter to that of other agencies or individuals with  
23 specialized expertise in a particular technical area. See, e.g.,  
24 *Am. Turnboat Ass'n v. Baldrige*, 738 F.2d 1013, 1016-17 (9th Cir.  
25 1984) (NMFS's decision under the Marine Mammal Protection Act was  
26 not supported by substantial evidence because agency ignored data  
27  
28

1 that was product of "many years' effort by trained research  
2 personnel"); *Sierra Club v. U.S. Army Corps of Eng'rs*, 701 F.2d  
3 1011, 1030 (2d Cir. 1983) ("court may properly be skeptical as to  
4 whether an EIS's conclusions have a substantial basis in fact if  
5 the responsible agency has apparently ignored the conflicting  
6 views of other agencies having pertinent experience[]") (internal  
7 citations omitted). A court should "reject conclusory assertions  
8 of agency 'expertise' where the agency spurns unrebutted expert  
9 opinions without itself offering a credible alternative  
10 explanation." *N. Spotted Owl v. Hodel*, 716 F. Supp. 479, 483  
11 (W.D. Wash. 1988) (citing *Am. Turnboat Ass'n*, 738 F.2d at 1016).

12  
13 In *Conner v. Burford*, 848 F.2d 1441, 1453-54 (9th Cir.  
14 1988), the agency attempted to defend its biological opinions by  
15 arguing that there was a lack of sufficient information to  
16 perform additional analysis. In rejecting this defense, the  
17 Ninth Circuit held that "incomplete information ... does not  
18 excuse the failure to comply with the statutory requirement of a  
19 comprehensive biological opinion using the best information  
20 available," and noted that FWS could have completed more analysis  
21 with the information that was available. *Id.* at 1454.  
22

23  
24 In light of the ESA requirement that the agencies use  
25 the best scientific and commercial data available ...  
26 the FWS cannot ignore available biological info or fail  
27 to develop projections of ... activities which may  
28 indicate potential conflicts between development and  
the preservation of protected species. We hold that  
the FWS violated the ESA by failing to use the best  
information available to prepare comprehensive  
biological opinions.

1 *Id.* (emphasis added).  
2

3 (5) Best Available Science Standards and the Application of  
4 Analytical/Statistical Methodologies.

5 The above-described standards apply with equal force to the  
6 use and interpretation of statistical methodologies. As the D.C.  
7 Circuit in *Appalachian Power Co. v. EPA*, 135 F.3d 791 (D.C. Cir.  
8 1998), explained in reviewing a challenge to a decision of the  
9 Environmental Protection Agency ("EPA") under the "arbitrary and  
10 capricious" standard of review:

11 Statistical analysis is perhaps the prime example of  
12 those areas of technical wilderness into which judicial  
13 expeditions are best limited to ascertaining the lay of  
14 the land. Although computer models are "a useful and  
15 often essential tool for performing the Herculean  
16 labors Congress imposed on EPA in the Clean Air Act,"  
17 [citation] their scientific nature does not easily lend  
18 itself to judicial review. Our consideration of EPA's  
19 use of a regression analysis in this case must  
20 therefore comport with the deference traditionally  
21 given to an agency when reviewing a scientific analysis  
22 within its area of expertise without abdicating our  
23 duty to ensure that the application of this model was  
24 not arbitrary.

19 *Id.* at 802.

20 The model must fit the available data. See *Nat'l Wildlife*  
21 *Fed'n v. EPA*, 286 F.3d 554, 565 (D.C. Cir. 2002) ("*NWF v. EPA*")  
22 (a court will only reject the choice of a model "when the model  
23 bears no rational relationship to the characteristics of the data  
24 to which it was applied"). For example, *Oceana*, 384 F. Supp. at  
25 220, rejected a challenge to NMFS's use of a particular  
26 analytical model that used data drawn from existing literature,  
27 even though experts "suggested that reliable take limits cannot  
28

1 be established without quantitative data gathered from 'in-water'  
2 surveys." Although NMFS conceded "a thorough quantitative  
3 analysis based on empirical estimates of population size would be  
4 a superior way to analyze the impact [] on [the species]," it was  
5 undisputed that "given the paucity of information on sea turtles  
6 and the difficulties of using the data that does exist, '[a]  
7 different or more complex model [than that used by NMFS] was not  
8 available and could not even be constructed.'" *Id.* Likewise,  
9 "the fact that a given model has some imperfections does not  
10 prevent it from constituting the 'best scientific information  
11 available.'" *Oceana v. Evans*, 2005 WL 555416, \*16-\*17 (D.D.C.  
12 Mar. 9, 2005) (citing 16 U.S.C. § 1851(a)(2)) (approving NMFS's use  
13 of a model despite known limitations, where it was the only model  
14 available and the agency supplemented its analysis with other  
15 sources to address areas where the model was unable to make  
16 accurate predictions).  
17  
18

## 19 VII. ANALYSIS

### 20 A. Challenges to the Effects Analysis & Related Challenges to 21 the RPA Actions.

#### 22 (1) Legal Requirements for a Project Effects Analysis.

23 Under section 7(a)(2) of the ESA and the Joint Consultation  
24 Regulations, FWS must "[e]valuate the effects of the action and  
25 cumulative effects on the listed species or critical habitat."  
26 50 C.F.R. § 402.14(g)(3). FWS must then "[f]ormulate its  
27 biological opinion as to whether the action, taken together with  
28

1 cumulative effects,<sup>7</sup> is likely to jeopardize the continued  
2 existence of listed species or result in the destruction or  
3 adverse modification of critical habitat." § 402.14(g)(4). The  
4 effects of the action are defined as:

5 the direct and indirect effects of an action on the  
6 species or critical habitat, together with the effects  
7 of other activities that are interrelated or  
8 interdependent with that action, that will be added to  
the environmental baseline.

9 § 402.02.

10 The environmental baseline includes:

11 the past and present impacts of all Federal, State, or  
12 private actions and other human activities in the  
13 action area, the anticipated impacts of all proposed  
14 Federal projects in the action area that have already  
15 undergone formal or early section 7 consultation, and  
the impact of State or private actions which are  
contemporaneous with the consultation in process.

16 *Id.* The baseline is described in FWS and NMFS's Joint  
17 Consultation Handbook<sup>8</sup> as:

18 an analysis of the effects of past and ongoing human  
19 and natural factors leading to the current status of  
20 the species, its habitat (including designated critical  
21 habitat), and ecosystem, within the action area. The  
22 environmental baseline is a "snapshot" of a species'  
health at a specified point in time. It does not  
include the effects of the action under review in the  
consultation.

23 Consultation Handbook 4-22.

---

24  
25 <sup>7</sup> Cumulative effects are "those effects of future State or private  
26 activities, not involving Federal activities, that are reasonably certain to  
occur within the action area of the Federal action subject to consultation."  
50 C.F.R. § 402.02.

27 <sup>8</sup> FWS and NMFS issued their final joint Endangered Species Handbook  
28 ("Handbook" or "Consultation Handbook") in 1999. 64 Fed. Reg. 31,285 (June  
10, 1999). The entire Handbook is available at  
[http://www.fws.gov/endangered/esa-library/pdf/esa\\_section7\\_handbook.pdf](http://www.fws.gov/endangered/esa-library/pdf/esa_section7_handbook.pdf).



1           Once the baseline, the "direct and indirect effects" of the  
2           action, and the "effects of other activities that are  
3           interrelated or interdependent with that action" are determined,  
4           50 C.F.R. § 402.02, FWS then is required to consider whether, in  
5           light of the environmental baseline, the effects of the action,  
6           taken together with cumulative effects, are likely to jeopardize  
7           the continued existence of the listed species, 50 C.F.R.  
8           § 402.14(g).

9                           [An] agency may not take action that will tip a species  
10                           from a state of precarious survival into a state of  
11                           likely extinction. Likewise, even where baseline  
12                           conditions already jeopardize a species, an agency may  
13                           not take action that deepens the jeopardy by causing  
14                           additional harm.

15                           ....[The agency must] appropriately consider the  
16                           effects of its actions "within the context of other  
17                           existing human activities that impact the listed  
18                           species." *ALCOA [v. Administrator, Bonneville Power  
19                           Admin]*, 175 F.3d [1156,] 1162 n. 6 [(9th Cir.  
20                           1999)] (citing 50 C.F.R. § 402.02's definition of the  
21                           environmental baseline). This approach is consistent  
22                           with our instruction ... that "[t]he proper baseline  
23                           analysis is not the proportional share of  
24                           responsibility the federal agency bears for the decline  
25                           in the species, but what jeopardy might result from the  
26                           agency's proposed actions in the present and future  
27                           human and natural contexts." [*PCFFA v. U.S. Bureau of  
28                           Reclamation*], 426 F.3d [1082,] 1093 [(9th Cir.  
2005)] (emphasis added).

*NWF v. NMFS II*, 524 F.3d at 930 (emphasis in original).

          To jeopardize means "to engage in an action that reasonably  
would be expected, directly or indirectly, to reduce appreciably  
the likelihood of both the survival and recovery of a listed

1 species." 50 C.F.R. § 402.02. The Consultation Handbook further  
2 provides that to "appreciably diminish the value: [means] to  
3 considerably reduce the capability of designated [critical  
4 habitat]." Consultation Handbook at 4-36. A related case found:

5  
6 interpretation of "appreciably" to mean any  
7 "perceptible" effect would lead to irrational results,  
8 making any agency action that had any effects on a  
9 listed species a "jeopardizing" action. This is not  
the law, as such an interpretation conflicts with other  
provisions of the ESA that permit incidental take of  
listed species.

10 *PCFFA v. Gutierrez*, 1:06-cv-00245 OWW GSA, Doc. 367 at 23-24  
11 (citing 16 U.S.C. 1536(b)(4), 1539(1)(B)).

12  
13 (2) Best Available Science Challenges to the Effects  
14 Analysis and Related Challenges to the Justification  
Provided for the RPA Actions.

15 Plaintiffs argue that the project effects analysis is  
16 predicated upon scientific errors that render the BiOp and its  
17 conclusion that project operations jeopardize the delta smelt  
18 arbitrary, capricious and an abuse of discretion:

19  
20 The Project Effects Analysis is the heart of the  
21 section 7 consultation process, providing the basis for  
22 FWS' jeopardy and adverse modification determinations  
23 and for formulating the RPA. In this case, FWS began  
24 the Project Effects Analysis of the 2008 Smelt BiOp  
25 with a remarkable assumption: "The following analysis  
26 assumes that the proposed CVP/SWP operations affect  
27 delta smelt throughout the year either directly through  
28 entrainment or indirectly through influences on its  
food supply and habitat suitability." BiOp at 203 (AR  
000218.) This assumption plainly violates the "best  
available science" required by the ESA. The science,  
including the reports that FWS purports to rely on,  
shows that OMR flows and entrainment do not have any  
statistically significant effect on the delta smelt's

1 population growth rate. Restricting flows has no  
2 effect on the delta smelt population's survival—such  
3 restrictions are a costly, but meaningless gesture.  
4 The same is true for [restrictions designed to control  
5 the position of] X2 [in the Fall].

6 Doc. 551 at 8.

7 Plaintiffs maintain that the best available science does not  
8 support FWS' "assumption" that "CVP/SWP operations affect delta  
9 smelt throughout the year either directly through entrainment or  
10 indirectly through influences on its food supply and habitat  
11 suitability." BiOp at 203. Plaintiffs maintain that the science  
12 demonstrates:

13 (a) OMR flows have no statistically significant effect  
14 on the delta smelt population growth rate;

15 (b) With respect to the adult population, only OMR  
16 flows more negative than -6,100 cfs will correlate to  
17 an increase in entrainment;<sup>9</sup>

18 (c) The location of Fall X2 does not determine the  
19 extent and quality of suitable smelt habitat -- as with  
20 OMR flows, Fall X2 has no statistically significant  
21 effect on the population growth rate; and,

22 (d) The CVP/SWP projects do not indirectly govern  
23 abiotic and biotic factors in the Delta that affect  
24 delta smelt abundance.

25 Doc. 551 at 11. Plaintiffs also maintain that there is no  
26 scientific support for the BiOp's assumption that the Projects  
27 control hydrodynamic conditions in the Delta, or for the BiOp's  
28 classification of non-Project causes of harm as "indirect

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<sup>9</sup> As this argument was supported exclusively by portions of the  
declaration of Dr. Richard B. Deriso that have been stricken, Doc. 750 at ¶ 3,  
this argument cannot be considered.

1 effects" of Project Operations. *Id.*

2  
3 a. The BiOp's General Conclusion that Entrainment by  
4 Project Operations Adversely Affects Smelt  
5 Survival & Recovery is Supported by the Record.

6 The magnitude of diversions at the CVP and SWP pumping  
7 facilities influences flows throughout the Delta, including in  
8 the Old and Middle Rivers ("OMR"). *BiOp* at 160. When the level  
9 of diversion at the pumps is high, Old and Middle Rivers may flow  
10 backwards (in the opposite direction than they would under  
11 natural hydrological conditions) and toward the CVP and SWP  
12 natural conditions (called "negative" flows). *Id.* Negative OMR  
13 flows draw delta smelt present in the central and south Delta  
14 toward the pumps, and high negative flows increase the risk that  
15 they will be entrained at the pumps. *Id.* at 163, 253 (Figure E-  
16 7).

17 Unlike larger fish species, entrainment is lethal for weak-  
18 swimming delta smelt. *Id.* at 145. Relying on estimates of  
19 proportional entrainment presented by Dr. Wim Kimmerer in a 2008  
20 paper entitled "Losses of Sacramento River Chinook Salmon and  
21 Delta Smelt to Entrainment in Water Diversions in the Sacramento-  
22 San Joaquin Delta," published in the journal, *San Francisco*  
23 *Estuary & Watershed Science* ("Kimmerer (2008)"), the *BiOp*  
24 concludes that "[t]otal annual entrainment of the delta smelt  
25 population (adults and their progeny combined) ranged from  
26 approximately 10 percent to 60 percent per year from 2002-2006."  
27  
28

1 *Id.* at 210. In years when low flows and high exports coincide  
2 with a spawning distribution of the delta smelt that includes the  
3 San Joaquin River, the loss of larval delta smelt due to  
4 entrainment can exceed 50% of the population. *Id.* at 164-65.  
5 Such losses do not occur every year, but FWS concluded the effect  
6 of these large larval loss events is "substantial when it does,"  
7 particularly in light of the fact that the delta smelt is an  
8 annual fish. *Id.* at 165. Even one year where its spawning  
9 occurs "within the footprint of entrainment by the pumps" can  
10 lead to "a [severe] reduction in that year's production." *Id.*

11  
12 The BiOp's Effects Analysis concludes that Project pumping  
13 operations have a "sporadically significant" adverse effect on  
14 smelt abundance:  
15

16 The population-level effects of delta smelt entrainment  
17 vary; delta smelt entrainment can best be characterized  
18 as a sporadically significant influence on population  
19 dynamics. Kimmerer (2008) estimated that annual  
20 entrainment of the delta smelt population (adults and  
21 their progeny combined) ranged from approximately 10  
22 percent to 60 percent per year from 2002-2006. Major  
23 population declines during the early 1980s (Moyle et  
24 al. 1992) and during the recent POD years (Sommer et  
25 al. 2007) were both associated with hydrodynamic  
26 conditions that greatly increased delta smelt  
27 entrainment losses as indexed by numbers of fish  
28 salvaged. However, currently published analyses of  
long-term associations between delta smelt salvage and  
subsequent abundance do not support the hypothesis that  
entrainment is driving population dynamics year in and  
year out (Bennett 2005; Manly and Chotkowski 2006;  
Kimmerer 2008).

26 BiOp at 210 (emphasis added). This passage was based in large  
27 part on Kimmerer (2008), which states:  
28

1 Delta smelt may suffer substantial losses to export  
2 pumping both as pre-spawning adults and as larvae and  
3 early juveniles. In contrast to the situation for  
4 salmon, pre-salvage mortality has been constrained in  
5 the calculations for adult Delta smelt, and its effects  
6 eliminated from the calculations for larval/juvenile  
7 Delta smelt. Combining the results for both life  
8 stages, losses may be on the order of zero to 40  
9 percent of the population throughout winter and spring.  
10 The estimates have large confidence limits, which could  
11 be reduced by additional sampling, particularly to  
12 estimate  $\theta$  in Equation 18. If there is interest in  
13 improving these estimates further, some attempts should  
14 be made to examine the assumptions not fully tested  
15 above, particularly those used in extrapolating larval  
16 abundance to hatch dates.

17 AR 018877.

18 Plaintiffs argue that the BiOp misinterprets and misapplies  
19 Kimmerer's work. Dr. Bryan Manly, Plaintiffs' expert in the  
20 fields of biostatistics and population survey design, addressed  
21 the BiOp's statement that "delta smelt entrainment can best be  
22 characterized as a sporadically significant influence on  
23 population dynamics." Manly Decl., Doc. 397, at ¶ 7. Manly  
24 opines that "[t]his statement is unclear and confusing," and  
25 explains:

26 If the Service meant only that abundance at a point in  
27 time during a single year may vary depending upon  
28 entrainment, then Kimmerer's estimates support that  
statement. But if, as appears more likely, the Service  
was relying upon Kimmerer's estimates to support a  
conclusion that entrainment sometimes causes abundance  
to vary significantly later in the same year or in  
following years, then the statement in the BiOp has no  
scientific basis.

*Id.* Kimmerer (2008) only estimated percentage losses of delta  
smelt within single year classes, and did not conclude that such

1 losses reduce population abundance from one year to the next.  
2 *Id.* at ¶ 8. In fact, Kimmerer (2008) contains a number of  
3 disclaimers, including the caveat that "export effects" on smelt  
4 are small relative to other factors affecting survival:

5 Although the upper bound of [the 0-40% loss] range  
6 represents a substantial loss, the effect of this loss  
7 is complicated by subsequent variability in survival  
8 (Figure 17). If this variability is uncorrelated with  
9 entrainment losses, then these losses will contribute  
10 little to the variability in fall abundance index. The  
11 simplest way to evaluate this is by regression of fall  
12 midwater trawl index on winter-spring export flow, but  
13 this relationship is contaminated by the downward step  
14 change in abundance in approximately 1981-1982,  
15 together with the long-term upward trend in export flow  
16 (mainly up to the mid-1970s, see Kimmerer 2004).  
17 Including this step in a regression model eliminates  
18 the effect of export flow on the fall midwater trawl  
19 index (coefficient =  $-1.5 \pm 2.4$ , 95% CL, 36 df). It  
20 seems unlikely that the downward step change was due to  
21 the earlier increase in export flow; furthermore,  
22 despite substantial variability in export flow in years  
23 since 1982, no effect of export flow on subsequent  
24 midwater trawl abundance is evident.

25 This is not to dismiss the rather large proportional  
26 losses of delta smelt that occur in some years; rather,  
27 it suggests that these losses have effects that are  
28 episodic and that therefore their effects should be  
29 calculated rather than inferred from correlative  
30 analyses. In the absence of density dependence, using  
31 means in Figure 15 with natural mortality, fall  
32 abundance should have been reduced by ~ 10% during  
33 1995-2005. This would have an equivalent effect of  
34 reducing the summer-fall survival index by 10%. This  
35 would have made little difference to fall abundance in  
36 the context of the approximately 50-fold variation in  
37 summer-fall survival (Figure 17), and would be  
38 difficult to detect through correlation.

39 Although summer-fall survival appears to dominate  
40 variability in abundance of delta smelt in fall (Figure  
41 17), this does not imply that control of export effects  
42 would be fruitless, as these effects can be

1 considerable during dry years. Management of delta  
2 smelt should incorporate any opportunities that arise  
3 to improve habitat or food supply and to reduce any  
4 negative impacts of predation or toxic contamination.  
5 However, current evidence does not provide a clear path  
6 toward improving the status of delta smelt using these  
7 factors. Manipulating export flow (and, to some extent,  
8 inflow) is the only means to influence the abundance of  
delta smelt that is both feasible and supported by the  
current body of evidence, even though export effects  
are relatively small. The results presented here can be  
used to suggest when, and under what conditions,  
control of export effects would be most helpful.

9 AR 018878. Kimmerer (2008) concludes that even though  
10 correlative analysis revealed "no effect of export flow on  
11 subsequent midwater trawl abundance," there is reason to be  
12 concerned about episodic effects caused by "large proportional  
13 losses of delta smelt that occur in some years." *Id.* As a  
14 result, according to Kimmerer (2008), population level effects  
15 should be calculated, rather than inferred from correlative  
16 analysis. *Id.* After performing such a calculation, Kimmerer  
17 (2008) concluded that entrainment reduced "the summer-fall  
18 survival index by ~10%" during 1995-2005. *Id.* Although this 10%  
19 figure was small in the context of the 50-fold variation in  
20 summer-fall survival, Kimmerer (2008) nonetheless recommended  
21 controlling export effects on smelt because "[m]anipulating  
22 export flow (and to some extent, inflow) is the only means to  
23 influence the abundance of delta smelt that is both feasible and  
24 supported by the current body of evidence, even though export  
25 effects are relatively small." *Id.* (emphasis added).  
26  
27  
28



1 Dr. Manly is correct that Kimmerer (2008) does not support  
2 the position that entrainment has a "sporadically significant"  
3 effect on delta smelt abundance from one year to the next.

4 However, contrary to Dr. Manly's suggestion, the BiOp does not  
5 rely on Kimmerer (2008) for this premise. The BiOp qualifies its  
6 reliance on Kimmerer (2008), consistent with the narrow scope of  
7  
8 Kimmerer's findings:

9 The population-level effects of delta smelt entrainment  
10 vary; delta smelt entrainment can best be characterized  
11 as a sporadically significant influence on population  
12 dynamics. Kimmerer (2008) estimated that annual  
13 entrainment of the delta smelt population (adults and  
14 their progeny combined) ranged from approximately 10  
15 percent to 60 percent per year from 2002-2006. Major  
16 population declines during the early 1980s (Moyle et  
17 al. 1992) and during the recent POD years (Sommer et  
18 al. 2007) were both associated with hydrodynamic  
19 conditions that greatly increased delta smelt  
20 entrainment losses as indexed by numbers of fish  
21 salvaged. However, currently published analyses of  
22 long-term associations between delta smelt salvage and  
23 subsequent abundance do not support the hypothesis that  
24 entrainment is driving population dynamics year in and  
25 year out (Bennett 2005; Manly and Chotkowski 2006;  
26 Kimmerer 2008).

27 BiOp at 210 (emphasis added). It was not unreasonable for FWS to  
28 rely on Kimmerer (2008) to conclude that salvage events may be  
"sporadically significant." Plaintiffs' argument that FWS  
misinterpreted Kimmerer (2008) is unfounded. Kimmerer (2008)  
explains why, despite the absence of a statistically significant  
correlation between export pumping and the subsequent year's  
smelt population (i.e., between export pumping and the population  
growth rate), the demonstrated "sporadically significant" loss of

1 smelt within year classes could significantly contribute to the  
2 species' jeopardy. FWS reasonably relied on Kimmerer (2008) for  
3 this finding.

4 Applying Kimmerer's estimates of entrainment and other data,  
5 the BiOp analyzed the effect Project operations have on the  
6 frequency of relatively large loss events. For larval and  
7 juvenile delta smelt:  
8

9 Kimmerer (2008) proposed a method for estimating the  
10 percentage of the larval-juvenile delta smelt  
11 population entrained at Banks and Jones each year.  
12 These estimates were based on a combination of larval  
13 distribution data from the 20-mm survey, estimates of  
14 net efficiency in this survey, estimates of larval  
15 mortality rates, estimates of spawn timing, particle  
16 tracking simulations from DWR's DSM-2 particle tracking  
17 model, and estimates of Banks and Jones salvage  
18 efficiency for larvae of various sizes. Kimmerer  
19 estimated larval-juvenile entrainment for 1995-2005. We  
20 used Kimmerer's entrainment estimates to develop  
21 multiple regression models to predict the proportion of  
22 the larval-juvenile delta smelt population entrained  
23 based on a combination of X2 and OMR....

24 BiOp at 220. The BiOp predicts that "the proposed action will  
25 decrease the frequency of years in which estimated entrainment is  
26 [less than or equal to] 15 percent. Thus, over a given span of  
27 years, the project as proposed will increase larval-juvenile  
28 entrainment relative to 1995-2005 levels. This will have an  
adverse effect on delta smelt based on their current low  
population levels." BiOp at 222.

For adult delta smelt:

The median OMR flows from the CALSIM II modeled  
scenarios were more negative than historic OMR flow for

1 all WY types except critically dry years (Figure E-3;  
2 see Table E-5b for all differences). Overall, proposed  
3 OMR flows are likely to generate increases in  
4 population losses compared to historic years (Figure E-  
5 5 and Figure E-6). For example, the frequency of years  
6 when population losses are less than 10 percent from  
7 most modeled studies (except studies 7.0 and 8.0) is  
8 less than 24 percent compared to historic estimates  
9 that only exceed 10 percent in approximately half of  
10 the years.

11 The most pronounced differences occur during wet years,  
12 where median OMR flows are projected to be  
13 approximately 400 to 600 percent (-7100 to -3678 cfs)  
14 higher than historical wet years (-1032 cfs).  
15 Generally, wet years are marked by low salvage and  
16 population losses. However, the proposed operations  
17 during wet year are predicted to cause up to a 65  
18 percent increase in smelt salvage and lower probability  
19 that population losses will be below 10 percent.

20 The proposed operation conditions likely to have the  
21 greatest impact on delta smelt are those modeled during  
22 above normal WYs. The modeled OMR flows for the above  
23 normal WYs ranged between -8155 and -6242 cfs, a 33 to  
24 57 percent decrease from the historic median of -5178  
25 cfs. Though the predicted salvage would only be about  
26 15-20 percent higher than historic salvage during these  
27 years (Table E-5c), the modeled OMR flows in these  
28 years would increase population losses compared to  
historic years.

In below normal and dry WYs, proposed OMR flows are  
also modeled to decrease from historic medians.  
Predicted salvage levels are likely to increase between  
2 and 44 percent. More importantly, the modeled median  
flows from all studies in these WY types range between  
-5747 and -7438 cfs. Modeled OMR flows at these levels  
are predicted to increase salvage and increase the  
population losses from historic levels as well.

During critically dry years, the median OMR flows for  
studies 7.0, 7.1, 8.0, 9.1, 9.4, and 9.5 are less than  
-5,000 cfs. These studies have predicted salvage lower  
than historic salvage and are not likely to generate  
larger population losses compared to historic years.  
The models might overestimate salvage during critical  
dry years when smelt are unlikely to migrate towards

1 the Central Delta due to lack of turbidity or first  
2 flush. Thus, the effects of critical dry operations on  
3 delta smelt take are probably small and lower than  
4 estimated.

4 In summary, adult entrainment is likely to be higher  
5 than it has been in the past under most operating  
6 scenarios, resulting in lower potential production of  
7 early life history stages in the spring in some years.  
8 While the largest predicted effects occur in Wet and  
9 Above Normal WYs, there are also likely adverse effects  
10 in Below Normal and Dry WYs. Only Critically Dry WYs  
11 are generally predicted to have lower entrainment than  
12 what has occurred in the recent past.

10 BiOp at 212-13.

11 This approach is consistent with Kimmerer (2008). The BiOp  
12 does not focus on whether there is a statistically significant  
13 correlation between OMR flows and the population growth rate.<sup>10</sup>  
14 Rather, following Kimmerer (2008), the BiOp focuses on predicting  
15 the frequency of large salvage events and concluded that Project  
16 operations increase their frequency. It was not arbitrary,  
17 capricious, or clear error for FWS to base its jeopardy  
18 conclusion in part on these predictions of relative increases in  
19 entrainment. See BiOp at 276.

22 b. Population Level Analysis/Life-Cycle Modeling.

23 Plaintiffs maintain the BiOp's failure to employ a life-

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25 <sup>10</sup> FWS did rely on a study by Manly and Chotkowski that found a  
26 statistically significant correlation between OMR flows and smelt abundance,  
27 albeit a small one. See BiOp at 159 ("Manly and Chotkowski (2006; IEP 2005)  
28 found that monthly or semi-monthly measures of exports or Old and Middle  
rivers flow had a reliable, statistically significant effect on delta smelt  
abundance; however, individually they explained a small portion (no more than  
a few percent) of the variability in the fall abundance index of delta smelt  
across the entire survey area and time period.").

1 cycle model ignored the best available science. Doc. 551 at 21-  
2 22. Using a quantitative<sup>11</sup> life-cycle model<sup>12</sup> is a recognized  
3 (the best) method to evaluate the effects of an action upon a  
4 fish population's growth rate. Dr. Richard B. Deriso<sup>13</sup> opined  
5 that a population growth rate analysis is the generally accepted  
6 method utilized by fisheries biologists to evaluate the impact of  
7 a stressor on a fish species' population. Declaration of Dr.  
8 Richard B. Deriso, Doc 401, at ¶ 36; see also Declaration of Dr.  
9 Ray Hilborn<sup>14</sup>, Doc. 393, at ¶¶ 7-16 (agreeing that life-cycle  
10 models are the accepted method in population dynamics to evaluate  
11 anthropogenic effects on the probability of growth or decline of  
12 a species); Declaration of Ken B. Newman<sup>15</sup>, Doc. 484, at ¶ 8  
13 (agreeing with "utility of life history models for assessing  
14 population level effects of SWP/CVP operations."). Dr. Hilborn  
15 explained that a quantitative population dynamics/life cycle  
16 model can help distinguish human actions that have a significant  
17 impact on population size from those that have little impact on  
18 population size, because competition for a resource that is  
19 independent of the human activity may cause significant mortality  
20  
21  
22

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23 <sup>11</sup> The BiOp used a relatively simple, non-quantitative, conceptual life-  
24 cycle model. See BiOp at 203. It is undisputed that no quantitative life  
25 cycle model was employed.

26 <sup>12</sup> The experts use the term "population dynamics model," "life history  
27 model," and "life cycle model" interchangeably.

28 <sup>13</sup> Dr. Deriso is an expert in the field of quantitative ecology and its  
application to fisheries management. Deriso Decl., Doc. 396, at ¶¶ 5-10.

<sup>14</sup> Dr. Hilborn is an expert in aquatic and fishery sciences. Hilborn  
Decl., Doc. 393, at ¶ 1.

<sup>15</sup> Dr. Newman is an expert in mathematical statistics employed by FWS in  
Stockton, California.

1 at one stage in the species' life cycle, meaning that human  
2 actions that kill fish at that life stage may have little impact  
3 on the population level later in the life history. Hilborn  
4 Decl., Doc. 393 at ¶ 15.

5 Federal Defendants knew of the value of life-cycle modeling.  
6 At a March 8, 2007 meeting on the OCAP ESA Re-consultation,  
7 attended by FWS employees, the importance of using a life cycle  
8 model was emphasized and inquiry made about the progress to date.  
9 AR 016016 - 016017. During the Delta Smelt Action Evaluation  
10 Team meeting on August 8, 2008, that Team recognized that  
11 population models for delta smelt already had been developed, and  
12 that those models were a starting point for quantitative analyses  
13 when combined with appropriate assumptions. AR 011381-011382;  
14 see also AR 010023, 010027-010029.

15  
16  
17 There is considerable dispute over whether an appropriate  
18 life-cycle model (i.e., one sufficient to perform the types of  
19 analyses that would be helpful in the BiOp) existed at the time  
20 the BiOp issued. Dr. Newman declares:

21  
22 Despite the utility of life history models and despite  
23 the information that the various surveys provide about  
24 different life history stages, an adequately realistic  
25 quantitative delta smelt life history model that has  
26 been fit using fish survey data does not exist. The  
27 BiOp did in many places (e.g., pp 146, 184, 203)  
28 consider the full life history of delta smelt but  
considerations were via conceptual models in contrast  
to quantitative models with parameters estimated from  
data. Part of the difficulty is that there are  
currently no off-the-shelf computational programs for  
fitting such a model to data and one must develop

1 customized, computer intensive software. The need to  
2 model the spatial and temporal changes in population  
3 abundances and to account for the different sources of  
4 uncertainty makes model formulation and fitting  
5 complex. In particular, uncertainty in survey data, due  
6 to random sampling error and bias, complicates model  
7 fitting. Capture probabilities differ between surveys,  
8 the probabilities are largely unknown (despite efforts  
9 made to estimate them, for example, for FMWT data, see  
10 Newman 2008 (Administrative Record "AR" at 19782-  
11 19799)), and capture and fish presence probabilities  
12 are thus confounded. Furthermore, given the patchiness  
13 and heterogeneity of the spatial and temporal  
14 distribution of delta smelt and the relatively low  
15 capture probabilities (whatever they might be), the  
16 sampling errors associated with survey data can be  
17 quite large (Newman 2008 (AR at 19782-19799)). Failure  
18 to account for sampling errors may result in biased  
19 parameter estimates (including wrongly concluding  
20 density dependence; Shenk et al. 1998). *The*  
21 *difficulties are not insurmountable, but concentrated*  
22 *research efforts are required*. I know of three such  
23 efforts currently underway and at varying stages of  
24 development: (1) an individual-based model with a  
25 spatial component by Drs. Wim Kimmerer, San Francisco  
26 State University, William Bennett, University of  
27 California at Davis, Stephen Monismith, Stanford  
28 University, and Kenneth Rose, Louisiana State  
University; (2) a population-level life history model  
using information from multiple surveys by Dr. Mark  
Maunder, Inter American Tropical Tuna Commission; (3)  
similar to Maunder, a life history model with a spatial  
component based on multiple surveys' data has been  
conceptually sketched by me and others in the NCEAS POD  
working group. Given sufficient time and appropriate  
technical resources, including personnel, to focus on  
model formulation and fitting, these models might be  
available within a year.

Newman Decl., Doc. 484 at ¶ 5.

All of the experts agreed with Dr. Newman that, at the time  
the BiOp was issued, there was no "off-the-shelf" life-cycle  
model to apply to delta smelt. Considerable dispute exists over  
how long it should have taken FWS to develop a competent model.

1 It is undisputed that basic life-cycle models such as the Ricker  
2 model can be applied to fisheries data sets in relatively short  
3 order. Deriso Decl., Doc. 605, at ¶ 52. Dr. Deriso opined that  
4 FWS had all the data necessary to perform a life-cycle analysis.  
5 Deriso Decl., Doc. 401, at ¶ 70. Dr. Hilborn stated that a  
6 relatively complex life-cycle model that "follow[s] the size  
7 structure of delta smelt through their life history and fit this  
8 into the observed size structure" would "require no more than a  
9 few months time to construct, evaluate and use in a biological  
10 opinion." Hilborn Decl., Doc. 600 at ¶ 14. Dr. Punt, a 706  
11 Expert with expertise in fish population dynamics and  
12 biostatistics, see Doc. 394 at 2, stated "[i]t is surprising that  
13 a population dynamics model was not developed for delta smelt for  
14 the BiOp.... The model developed by Bennett could have been  
15 extended to more fully account for the biology of delta smelt and  
16 fitted to data to assess the population-level effects of impact  
17 of the project." Doc. 633-1 at 3.

18  
19  
20 Federal Defendants' expert, Mr. Feyer disagrees:

21 Developing a quantitative population model is a  
22 challenging and complex exercise that could not have  
23 been completed by USFWS within the timeframe required  
24 to issue the 2008 BiOp. The work requires a substantial  
25 investment of resources and individuals with very  
26 specialized skills. The process to develop, test, peer-  
27 review, and apply such models often takes years. For  
28 instance ... the development of models for Columbia  
River salmon ... took no less than three years to  
complete.

Because of the recognized urgent need for such tools,



1           there are on-going efforts to develop quantitative  
2           population models for delta smelt. For instance,  
3           Bennett (2005) presented preliminary results from a  
4           stage-structured model he is developing to examine  
5           tradeoffs among sources of mortality acting on  
6           different cohorts and life stages. See AR at 17004-74.  
7           The development of this model is part of a broader  
8           comprehensive effort by a team of researchers including  
9           Dr. Kenneth Rose of Louisiana State University, Dr. Wim  
10          Kimmerer of San Francisco State University, Dr. William  
11          Bennett of the University of California at Davis, and  
12          Dr. Stephen Monismith of Stanford University, who are  
13          in the early stages of developing, testing, and  
14          applying particle-tracking models, an individual-based  
15          model, and a matrix projection model. The development  
16          of these particular models is very promising but has  
17          also been faced with many challenges. Perhaps the most  
18          critical challenge has been a freeze on project funding  
19          by the State of California; it is uncertain if the  
20          funding will be reinstated. Another example is the work  
21          I have been personally involved with at NCEAS. The  
22          NCEAS team has used Bayesian changepoint techniques and  
23          multivariate autoregressive modeling to identify  
24          factors contributing to the decline of delta smelt and  
25          other species. The results of this work will be  
26          published in two papers in an upcoming issue of the  
27          journal Ecological Applications. I am aware of at least  
28          two other independent efforts of modeling the effects  
          of various stressors on delta smelt that are also under  
          development. Unfortunately, none of the work I mention  
          above was available when the 2008 BiOp was being  
          prepared. To my knowledge, no comprehensive  
          quantitative population dynamics model for the delta  
          smelt has been developed, subjected to peer-review, and  
          published.

...[Q]uantitative population models are grounded in  
what is known about the biology of a species, and  
processes that may plausibly affect its abundance....  
Although there is a substantial amount of data  
available on delta smelt, a key problem is that much of  
the sample data has increasingly contained zero values.  
These zeros are a reflection of declining population  
abundance. Such low numbers make it more difficult to  
acquire more recent information about the factors that  
drive delta smelt population dynamics, such as survival  
probabilities by life history stage, movement patterns  
and spatial distribution, and fecundity or reproductive

1 success. It is thus becoming increasingly difficult to  
2 not only simply estimate such factors, but also  
3 increasingly difficult to model how these factors are  
4 affected by environmental and anthropogenic processes  
5 such as those considered in the 2008 BiOp. The  
6 estimation of delta smelt population size exemplifies  
7 this problem. Newman (2008), see AR at 19782-99,  
8 recently published a sample design-based procedure for  
9 estimating the population abundance of pre-adult and  
10 adult delta smelt. However, the resulting estimates of  
11 population size were quite imprecise. This was caused,  
12 in part, by limitations of the available data to  
13 estimating capture probabilities and gear efficiency.

14 ... I agree ... that population dynamics models have  
15 been used to evaluate consequences of various stressors  
16 on a wide range of species and human impacts. I also  
17 agree that there is sufficient data to develop such a  
18 model for delta smelt, as demonstrated by the examples  
19 I provided above. However, although some are in  
20 development, the fact remains that no such model has  
21 been fully developed, peer-reviewed and made available  
22 for application. Thus, in the absence of such models, I  
23 disagree that that the techniques used by USFWS were  
24 inconsistent with generally-accepted scientific  
25 standards and practices. To the contrary, in the  
26 absence of such a model, and because one could not be  
27 developed during the time allowed for this  
28 consultation, the techniques used by USFWS do reflect  
generally-accepted scientific standards and practices.

Decl. of Frederick V. Feyrer<sup>16</sup>, Doc. 541, at ¶¶ 30-33. Plaintiffs  
do not suggest any party that participated in the preparation of  
the OCAP Biological Assessment ("OCAP BA" or "BA") or commented  
on the public review drafts of the BiOp during the consultation  
submitted to FWS a quantitative life cycle model or the results  
of such an analysis using a life cycle model for delta smelt.

The ESA does not require FWS's to generate new studies. In

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<sup>16</sup> Mr. Feyrer is a Reclamation Fish Biologist with an M.S. in biology. He has extensive experience researching and advising on fisheries management issues in the San Francisco Estuary. Feyrer Decl., Doc. 481, at ¶ 1.

1 *Southwest Center for Biological Diversity v. Babbitt*, 215 F.3d 58  
2 (D.C. Cir. 2000), the district court found "inconclusive" the  
3 available evidence regarding FWS's decision not to list the Queen  
4 Charlotte goshawk, and held that the agency was obligated to find  
5 better data on the species' abundance. The D.C. Circuit  
6 reversed, emphasizing that, although "the district court's view  
7 has a superficial appeal ... this superficial appeal cannot  
8 circumvent the statute's clear wording: The secretary must make  
9 his decision as to whether to list a species as threatened or  
10 endangered 'solely on the basis of the best scientific and  
11 commercial data available to him....' 16 U.S.C. § 1533(b) (1) (A)."  
12 *Id.* at 61 (emphasis added); see also *American Wildlands v.*  
13 *Kemphorne*, 530 F.3d 991, 998 (D.C. Cir. 2008) (the "best  
14 available data" standard "requires not only that the data be  
15 attainable, but that researchers in fact have conducted the  
16 tests").

17  
18  
19 Plaintiffs advocate a narrow reading of both *Southwest*  
20 *Center* and *American Wildlands*, arguing these cases only mean that  
21 the agency is not required to gather new data in the field  
22 regarding a species if such information is not already available.  
23 Doc. 697 at 22. Plaintiffs object that "[n]either of these cases  
24 supports Defendants' position that FWS could disregard the smelt  
25 abundance data that were already in its possession and fail to  
26 undertake the necessary statistical analyses to satisfy its  
27  
28

1 statutory mandate to determine 'whether the action ... is likely  
2 to jeopardize the continued existence of the species.' 50 C.F.R.  
3 § 402.14(g)(4)." *Id.*

4 Plaintiffs cite no authority suggesting that the non-  
5 existence of an analytical model should be treated any  
6 differently from the non-existence of raw field data. FWS did  
7 not have an off-the-shelf form of "statistical analysis" it could  
8 apply to determine the effects of Project Operations on the delta  
9 smelt population. Although life-cycle modeling is standard  
10 practice in the field of fisheries biology, and a life-cycle  
11 model is being (and should have been) developed for delta smelt,  
12 it is undisputed that an appropriate life cycle model had not  
13 been developed at the time the BiOp issued. FWS must apply the  
14 best "available" science; not the best science possible. FWS's  
15 failure to apply a life cycle model did not per se violate the  
16 ESA or the APA.

17 It is undisputed that application of a quantitative life  
18 cycle model is the preferred scientific methodology. Based on  
19 the preponderating expert testimony, FWS had the time and ability  
20 to prepare the necessary life-cycle model. FWS made a conscious  
21 choice not to use expertise available within the agency to  
22 develop one. A court lacks authority to require completion of a  
23 life-cycle model. In light of uncontradicted expert testimony  
24 that life-cycle modeling is necessary and feasible, FWS's failure  
25  
26  
27  
28

1 to do so is inexplicable.

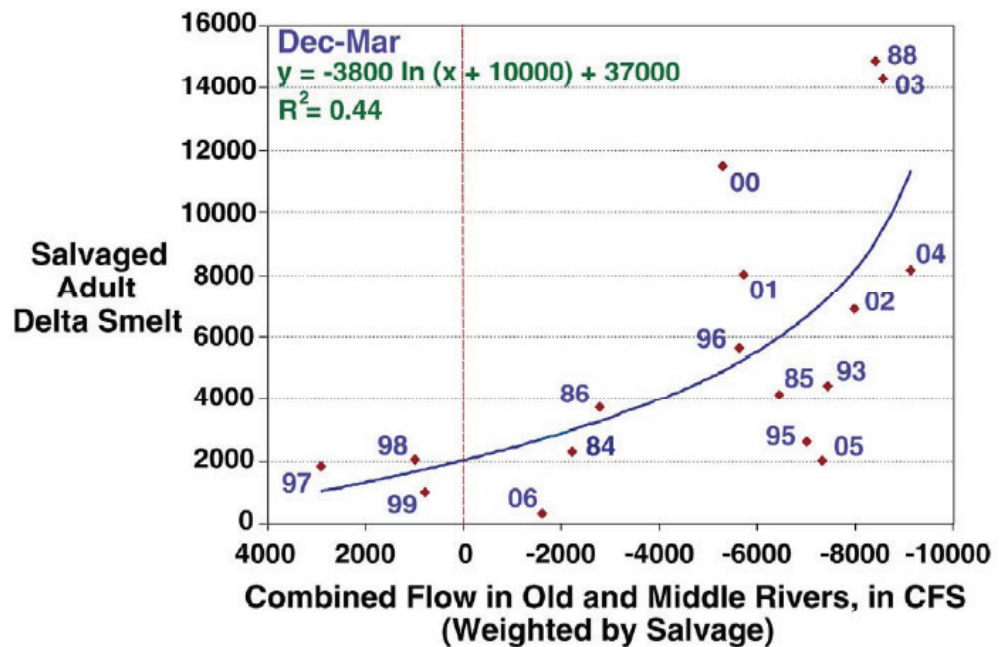
2  
3 c. FWS' Use of Raw Salvage Numbers.

4 Plaintiffs argue that FWS's use of raw salvage numbers in  
5 its quantitative justification for the flow prescriptions in  
6 Actions 1 and 2 constitutes a failure to apply the best available  
7 science. Action 1, designed to protect upmigrating delta smelt,  
8 is triggered during low and high entrainment risk periods based  
9 on physical and biological monitoring. Action 1 requires OMR  
10 flows to be no more negative than -2,000 cubic feet per second  
11 ("cfs") on a 14-day average and no more negative than -2,500 cfs  
12 for a 5-day running average. BiOp at 280-81, 329-30. Action 2,  
13 designed to protect adult delta smelt that have migrated upstream  
14 and are residing in the Delta prior to spawning, is triggered  
15 immediately after Action 1 ends or if recommended by the Smelt  
16 Working Group ("SWG"). Flows under Action 2 can be set within a  
17 range from -5,000 to -1,250 cfs, depending on a complex set of  
18 biological and environmental parameters. *Id.* at 281-82, 352-56.

19  
20 The BiOp provides a quantitative justification for these  
21 specific flow prescriptions in Attachment B, entitled  
22 "Supplemental Information related to the Reasonable and Prudent  
23 Alternative." The following subsection entitled, "Justification  
24 for Flow Prescriptions in Action 1," is critical to the present  
25 challenge and is reproduced here in its entirety:  
26  
27  
28

Justification for Flow Prescriptions in Action 1

Understanding the relationship between OMR flows and delta smelt salvage allows a determination of what flows will result in salvage. The OMR-Salvage analysis herein was initiated using the relationship between December to March OMR flow and salvage provided by P. Smith and provided as Figure B-13, below. Visual review of the relationship expressed in Figure B-13 indicates what appears to be a “break” in the dataset at approximately -5,000 OMR; however, the curvilinear fit to the data suggest that the break is not real and that the slope of the curve had already begun to increase by the time that OMR flows reached -5,000 cfs.



Note: Data shown are for the period 1984-2007, excluding years 1987, 1989-92, 1994, and 2007 that had low (<1.2ntu) average water turbidity during Jan-Feb at Clifton Court Forebay.

**Figure B-13. OMR-Salvage relationship for adult delta smelt. (source, P. Smith). Data from this figure were the raw data used in the piecewise polynomial regression analysis.**

Further, a nonlinear regression was performed on the dataset, and the resulting pseudo-R<sub>2</sub> value was 0.44—suggesting that although the curvilinear fit is a reasonable description of the data, other functional relationships also may be appropriate for describing the data. Fitting a different function to the data could also determine the location where salvage increased, i.e. identify the “break point” in the relationship between salvage and OMR flows. Consequently, an analysis was performed to determine if the apparent break at -5,000 cfs OMR was real. A piecewise polynomial regression, sometimes referred to as a multiphase model, was used to establish the change (break) point in the dataset.

1 A piecewise polynomial regression analysis with a linear-linear fit was performed  
2 using data from 1985 to 2006. The linear-linear fit was selected because it was the  
3 analysis that required the fewest parameters to be estimated relative to the amount  
4 of variation in the salvage data. Piecewise polynomial regressions were performed  
using Number Cruncher Statistical Systems (© Hintz, J., NCSS and PASS,  
Number Cruncher Statistical Systems, Kaysville UT).

5 The piecewise polynomial regression analysis resulted in a change point of -1162,  
6 i.e. at -1162 cfs OMR, the slope changed from 0 to positive (Figure B-14). These  
7 results indicate that there is a relatively constant amount of salvage at all flows  
8 more positive than -1162 cfs but that at flows more negative than -1162, salvage  
increases. The pseudo-R<sup>2</sup> value was 0.42, a value similar to that obtained by P.  
Smith in the original analysis.

9 To verify that there was no natural break at any other point, the analysis was  
10 performed using a linear-linear-linear fit (fitting two change points). The linear-  
11 linear-linear fit resulted in two change points, -1,500 cfs OMR and -2,930 cfs  
12 OMR. The -1,500 cfs value is again the location in the dataset at which the slope  
13 changes from 0 to positive. The pseudo-R<sup>2</sup> value is 0.42 indicating that this  
14 relationship is not a better description of the data. Because of the additional  
parameters estimated for the model, it was determined that the linear-linear-linear  
fit was not the best function to fit the data, and it was rejected. No formal AIC  
analysis was performed because of the obvious outcome.

15 A major assumption of this analysis is that as the population of Delta smelt  
16 declined, the number of fish at risk of entrainment remained constant. If the  
17 number of fish in the vicinity of the pumps declined, fewer fish would be entrained  
18 and more negative OMR flows would result in lower salvage. This situation would  
19 result in an overestimate, i.e. the change point would be more positive. In fact, if  
20 the residuals are examined for the relationship in Figure B-13 above, the salvage  
21 for the POD years 2002, 2004, 2005, and 2006 are all below the line. 2003 is  
22 above the line although the line is not extended to the points at the top of the  
23 figure, and these data points occur when the curve becomes almost vertical. The  
24 negative residuals could be a result of a smaller population size available for  
25 entrainment and salvage. This could be verified by normalizing the salvage data by  
26 the estimated population size based on the FMWT data.

22 //

23 //

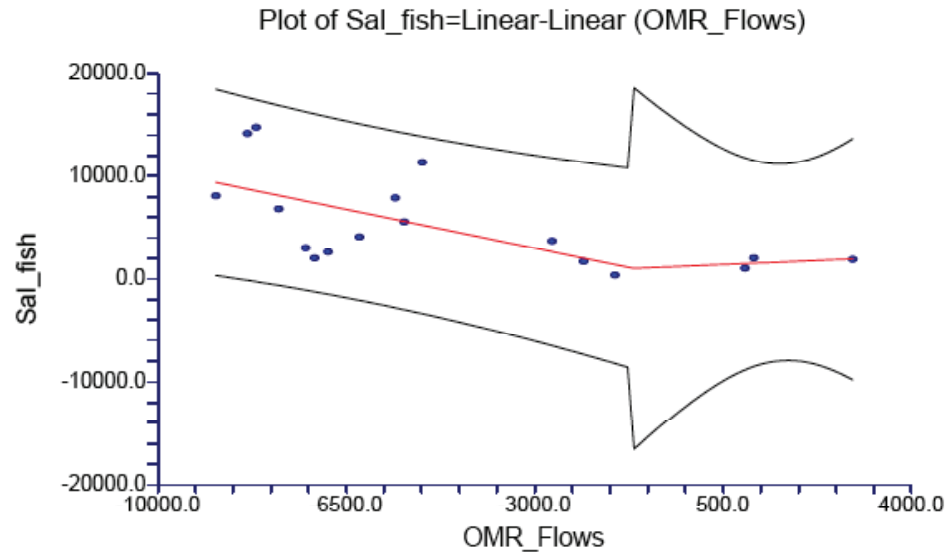
24 //

25 //

26 //

27 //

28 //



11 **Figure B-14. Piecewise polynomial regression of OMR flows and salvage. The**  
 12 **change point is the location at which the two regression lines meet; -1,162 cfs OMR.**

13 The original values of OMR and salvage could have been measured with error due  
 14 to a number of causes, consequently the values used in the original piecewise  
 15 polynomial analysis could be slightly different than the “true” values of salvage  
 16 and OMR flow. Consequently, a second analysis was undertaken to examine the  
 17 effect of adding stochastic variation to the OMR and salvage values in the  
 18 piecewise polynomial regression analysis. The correlation between OMR and  
 19 salvage in the original dataset was -0.61 indicating that the more negative the  
 20 OMR, the greater the salvage. Consequently, it was necessary to maintain the  
 21 original covariance structure of the data when adding the error terms and  
 22 performing the regressions. The original covariance structure of the OMR–salvage  
 23 data was maintained by adding a random error term to both parameters. The  
 24 random error term was added to OMR and a correlated error term was added to  
 25 salvage. The expected value of the correlated errors was -0.61.

26 The error terms were selected from a normal distribution with a mean of 1.0 and a  
 27 standard deviation of 0.25 which provided reasonable variability in the original  
 28 data. Operationally this process generated a normal distribution of OMR and  
 salvage values in which the mean of the distributions were the original data points.  
 Additional analyses were performed with standard deviations of 0.075, 0.025, and  
 0.125. Smaller standard deviations in the error term resulted in estimates of the  
 change point nearer to the original estimate of -1,162 cfs. This is to be expected as  
 the narrower the distribution of error terms, the more likely the randomly selected  
 values would be close to the mean of the distribution. The process was repeated  
 one hundred times, each time a new dataset was generated and a new piecewise  
 polynomial regression was performed. The software package @Risk (© Palisade  
 Decision Tools) was used to perform the Monte Carlo simulations. Latin



1 hypercube sampling was used to insure that the distributions of OMR and salvage  
2 values were sampled from across their full distributions. The parameter of interest  
3 in the simulations was the change point, the value of the OMR flow at which the  
4 amount of salvage began to increase. Incorporating uncertainty into the analysis  
5 moved the change point to -1,800 cfs OMR, indicating that at flows above -1683,  
6 the baseline level of salvage occurred but with flows more negative than -1683,  
7 salvage increased.

8 BiOp 347-51 (emphasis added).

9 The analyses contained in Figures B-13 and B-14 serve, *inter*  
10 *alia*, as justification for Action 1: setting "break points" above  
11 and below which entrainment rates noticeably change. These break  
12 points are the foundation for the tiered flow restrictions in RPA  
13 Action 1. Cay Collette Goude<sup>17</sup> stated in her expert declaration  
14 that the analysis conducted by Dr. Michael Johnson, set forth in  
15 Figure B-13, found inflection points where entrainment started to  
16 increase with more negative OMR flows, and that the inflection  
17 point "was -1,800 cfs OMR when uncertainty was factored into the  
18 analysis." Doc. 470, at ¶ 22. The BiOp does not explain in the  
19 "Justification for Flow Prescriptions in Action 1" or elsewhere  
20 how or why this -1,800 cfs figure relates to the -2,000 cfs upper  
21 limit imposed by Action 1.<sup>18</sup>

22 Action 2 calls for flows to be set within a range from

---

23 <sup>17</sup> Ms. Goude is the Assistant Field Supervisor for the Endangered Species  
24 Program in the Sacramento Fish and Wildlife Office, U.S. Fish and Wildlife  
25 Service. Goude Decl., Doc. 470, at ¶ 1.

26 <sup>18</sup> In explaining actions designed to protect juvenile smelt, Ms. Goude  
27 makes reference to another portion of Appendix B, which sets forth the  
28 justification for Action 3's restrictions to protect larval smelt. There, the  
BiOp states that "entrainment risk grows exponentially at OMR flows  
increasingly more negative than -2,000 cfs." BiOp at 381 (cited in Goude  
Decl. at ¶ 24). This conclusion appears to be based upon computer modeling  
using the Particle Tracking Method ("PTM"). The BiOp does not state that PTM  
modeling was used to formulate the flow prescriptions imposed by Action 1.

1 -5,000 to -1,250 cfs, depending on a complex set of biological  
2 and environmental parameters. BiOp at 281-82, 352-56. Although  
3 Appendix B describes and justifies Action 2 separately from  
4 Action 1, there is no independent section justifying the flow  
5 prescriptions imposed by Action 2. Instead, there is a sub-  
6 section entitled "Justification for Guidelines in Setting  
7 Prescriptions of Action 2" which fixes biological and  
8 environmental parameters the SWG is to use in setting flows  
9 within the -5,000 cfs to -1,250 cfs range. See BiOp at 355.  
10 There is no independent quantitative or qualitative justification  
11 for the upper and lower limits of that range. In fact, the  
12 "Justification for Guidelines in Setting Prescriptions of Action  
13 2" section contains the following statement:  
14  
15

16 Flow requirements defined within Action 2 follow the  
17 same protectiveness criterion established during Action  
18 1, as adjusted to reflect real-time conditions and  
19 predicted entrainment risk relative to the anticipated  
20 distribution and abundance of year-class delta smelt;  
21 and reflecting their behavioral propensity to hold in  
their chosen spawning habitat. These are allowed to  
vary based upon assessment of available data as  
described in the adaptive process described in the  
Introductions to Actions section above.

22 BiOp at 356.

23 Plaintiffs complain that the "Justification for Flow  
24 Prescriptions in Action 1" section does not represent the best  
25 available science because it is based upon analyses of gross (or  
26 "raw") salvage (i.e. the absolute number of fish salvaged over a  
27 given time period). The use of raw salvage data, as opposed to  
28

1 salvage data scaled to population size, is problematic because  
2 raw salvage figures do not account for the size (or relative  
3 size) of the smelt population. Deriso Decl., Doc. 401, at ¶ 28.  
4 The BiOp admits as much, and concedes that the analysis assumes  
5 that "as the population of Delta smelt declined, the number of  
6 fish at risk of entrainment remained constant." BiOp at 349.  
7  
8 Considering raw salvage numbers alone provides no means of  
9 distinguishing an event in which 10,000 fish are salvaged out of  
10 a population of 20,000 from an event in which 10,000 fish are  
11 salvaged from a population of 20 million. Deriso Decl., Doc.  
12 401, ¶ 28.

13  
14 There is widespread agreement among the scientific experts  
15 that the use of normalized salvage data rather than gross salvage  
16 data is the standard accepted scientific methodology among  
17 professionals in the fields of fisheries biology/management.  
18 Doc. 633-1 at 7, 10 (the 706 experts concluded that, although it  
19 is not inherently unreasonable to consider the analysis in Figure  
20 B-13, it would be unreasonable to rely on that analysis as the  
21 only basis for imposing flow restrictions); Deriso Decl., Doc.  
22 401 at ¶¶ 51-56 (FWS's reliance on Figure B-13 to conclude that  
23 as negative OMR flows increase, more adults are salvaged is  
24 "scientifically flawed because raw salvage numbers do not have a  
25 directly proportional effect on population and do not take into  
26 account the overall size of the population...."); Newman Decl.,  
27  
28

1 Doc. 484 at ¶ 11 (concurring with Dr. Deriso's "general notion of  
2 scaling salvage by some measure of population size.").

3 FWS was aware that raw salvage data posed this obvious  
4 problem. The BiOp itself recognized the necessity of normalizing  
5 raw salvage data:

6  
7 To provide context to determine the magnitude of effect  
8 of pre-spawning adult direct mortality through  
9 entrainment within any given season (as measured by  
10 salvage), it is necessary to consider two important  
11 factors....¶ The second factor to consider when  
relating salvage to population-level significance is  
that the total number salvaged at the facilities does  
not necessarily indicate a negative impact on the  
overall delta smelt population.

12 BiOp at 338. The August 26, 2008, draft meeting notes of FWS's  
13 Delta Smelt Action Evaluation Team state:

14 When analyzing the importance of entrainment to the  
15 species population structure or decline, the relevant  
16 fact to consider is the percentage of the population  
17 being removed via entrainment. Salvage data, by  
itself, may not be sufficient to help one understand  
the percentage of the population being removed via  
entrainment.

18 AR 010023. The Independent Peer Review of FWS's draft Effects  
19 Analysis for the BiOp also recommended to FWS that it  
20 "normalize[]" salvage to population size:

21 The panel suggests that the use of predicted salvage of  
22 adult smelt should be normalized for population size.  
23 Total number salvaged is influenced by a variety of  
24 factors, particularly the number of fish in the  
population.... Expressing salvage as a normalized  
index may help remove some of the confounding of the  
temporal trends during the baseline.

25 AR 008818. FWS used normalized salvage data in other parts of  
26 the BiOp, including the calculation of the Incidental Take Limit,  
27 evidencing its ability to do so. See Deriso Decl., Doc. 401, at  
28

1 ¶ 55 (citing BiOp at 386).

2 FWS nowhere explains its decision in the BiOp to use gross  
3 salvage numbers in Figures B-13 and B-14, and does not explain  
4 why it selectively used normalized salvage data in some parts of  
5 the BiOp but not in others. See Doc. 633-1 at 10 (Dr. Thomas  
6 Quinn, a 706 Expert with expertise in fisheries biology,  
7 estuarine ecology, and fish migration and movement, see Doc. 394  
8 at 2, stated: "it is not clear why such an adjustment [of  
9 salvage to population size] was not made for the data examined in  
10 this report."). This was arbitrary, capricious, and represents a  
11 failure to utilize the best available science in light of  
12 universal recognition that salvage data must be normalized. This  
13 significant error must be corrected on remand.  
14  
15

16 (1) Federal Defendants' Argument that the Flow  
17 Prescriptions in Actions 1 and 2 are  
18 Otherwise Justified.

19 Federal Defendants argue that the specific flow  
20 prescriptions in Actions 1 and 2 are supported by more than just  
21 Figures B-13 and B-14. By portraying a negative as a positive,  
22 Federal Defendants point out that nothing in the BiOp suggests  
23 Figures B-13 and B-14 are in fact being used to draw conclusions  
24 about what is happening to the delta smelt population as a whole.  
25 Doc. 660 at 32. The BiOp concedes that "when relating salvage  
26 data to population-level significance [ ] the total number  
27 salvaged at the facilities does not necessarily indicate a  
28

1 negative impact upon the overall delta smelt population." BiOp  
2 at 338. Instead, Federal Defendants suggest that the raw salvage  
3 numbers are used in "tandem" with other population-based  
4 analyses. Other sections of the BiOp demonstrate that salvage by  
5 the Project pumping facilities can have a "sporadically  
6 significant" effect on the delta smelt population.  
7

8 However, Federal Defendants concede that neither the  
9 research supporting the "sporadically significant" finding nor  
10 any related discussion in the BiOp generate the kind of  
11 "operational metric... needed so that Project pumping can be  
12 managed to prevent the entrainment numbers that these other  
13 population analyses deem necessary for avoiding population level  
14 effects." Doc. 660 at 32-33. Federal Defendants argue that the  
15 raw salvage analyses contained in Figures B-13 and B-14 are used  
16 solely to generate these "operational metrics":  
17

18 That is where raw salvage comes in - it works in tandem  
19 with these other population-based analyses, which  
20 Plaintiffs disregard. Specifically, Figures B-13 and  
21 B-14 are included to illustrate that the Projects  
22 quickly lose the ability to manage entrainment and  
23 salvage risk once OMR flows become more negative than -  
24 5000 cfs. This is the level at which it is believed  
25 that entrainment losses or the take level can be  
26 effectively managed. See BiOp at 366 (explaining that  
27 the function of the OMR flow targets is to manage  
28 entrainment risk).

25 *Id.* at 33. This argument does absolutely nothing to overcome the  
26 fact that the use of raw salvage in the analyses depicted in  
27 figures B-13 and B-14 is scientifically unacceptable. Those  
28

1 figures cannot accurately depict when the Projects "lose the  
2 ability to manage entrainment and salvage risk," because they do  
3 not scale salvage to population size. These figures do not take  
4 into account the possibility that one data point used to generate  
5 the curves depicted may have been collected in a year when the  
6 delta smelt population was 1,000,000, making it more likely that  
7 larger numbers of smelt would be present near the pumps to be  
8 salvaged, while another data point might have been collected  
9 during a year in which the population was 10,000, making it  
10 inherently less likely that large numbers of smelt would be found  
11 in salvage. The present record suggests that such metrics are  
12 meaningless as management tools. They cannot be used to set  
13 specific flow prescriptions. FWS was offered the opportunity to,  
14 but has not justified its approach.

17 At the same time, Federal Defendants contend that at least  
18 some of the "break points" reflected in the specific flow  
19 prescriptions of Components 1 and 2 are based on information  
20 unrelated to Figures B-13 and B-14. For example, in the  
21 justification for Action 3, which is designed to protect larval &  
22 juvenile smelt, the BiOp relies upon Particle Tracking Model  
23 ("PTM") results to explore the likelihood of entrainment of  
24 particles in the south Delta (used to represent that portion of  
25 the smelt population located in the south Delta) that would  
26 likely be entrained at various levels of negative OMR flow. This  
27  
28

1 is referenced as "entrainment risk":

2 The most efficient protective measure for protecting  
3 the resilience and not precluding the recovery of the  
4 delta smelt population specific to the larval/juvenile  
5 lifestage is to prevent entrainment of fish in as large  
6 a portion of the Central Delta as is practical. Results  
7 of PTM modeling focusing on protections at station 815  
8 (Prisoner's Point) indicates that precluding  
9 entrainment of larval/juvenile delta smelt at this  
10 station would also protect fish at station 812  
11 (Fisherman's Cut) and other stations north and west  
12 (downstream) of station 815. While the target  
13 entrainment at station 815 would ideally also be zero,  
14 there appears to be little additional entrainment  
15 protection (less than 5 percent) at OMR flows at -750  
16 cfs (the strictest level addressed by Interim  
17 Remedies). However, entrainment risk grows  
18 exponentially at OMR flows increasingly more negative  
19 than -2000 cfs.

20 Figure B-16 displays injection points for modeled  
21 particle tracking runs that were conducted in February  
22 2008 with injection points at Stations 711, 809, 812,  
23 815, 902, 915. This figure plots projected  
24 relationships for OMR flows by injection point,  
25 including entrainment probabilities for station 815  
26 (over 30 days).

27 The results from these runs indicate an approximate <5  
28 percent entrainment risk at OMR flow not more negative  
than -2000 cfs. At a requirement of -3,500 cfs OMR  
flow, entrainment risk at station 815 is roughly 20  
percent over each 30 day interval. Assuming cumulative  
entrainment is additive, over a roughly four month  
(~120 days) interval in which Action 3 would be under  
effect, consistently operating at -3,500 OMR would  
yield a net entrainment probability placing at risk  
approximately 80 percent of the larval/juvenile  
subpopulation utilizing the South Delta at and below  
Station 815. If immigration of larval smelt from the  
Central or North Delta into the zone of entrainment  
during spring were to occur, the population-level risk  
would be even greater. Such entrainment levels are  
potentially a significant adverse risk to delta smelt  
population.

BiOp at 366-68.

Although it seems logical that the PTM results and the  
"entrainment risk" PTM attempts to estimate have some  
applicability to the protection of adult smelt, the BiOp does not



1 rely upon these results to justify Actions 1 or 2. *NWF v. NMFS*  
2 *II*, 524 F.3d at 932, n.10 (a court "may not consider [a] post hoc  
3 justification, or infer 'an analysis that is not shown in the  
4 record.'" (quoting Gifford Pinchot Task Force, 378 F.3d at 1074,  
5 and citing *PCFFA v. U.S. Bureau of Reclamation*, 426 F.3d 1082,  
6 1091 (9th Cir. 2005) ("[W]e cannot infer an agency's reasoning  
7 from mere silence," and "an agency's action must be upheld, if at  
8 all, on the basis articulated by the agency.")).

9  
10 Federal Defendants also point out that Action 1 is based on  
11 "the historical observation that the first 'winter flush' moves  
12 delta smelt into portions of the delta where they are  
13 particularly vulnerable to entrainment, for biological and  
14 hydrological reasons that are well documented." Doc. 660 at 23  
15 (citing BiOp at 333-36). Federal Defendants argue:

16  
17 As the multiple sources of information relied upon by  
18 the BiOp on this point demonstrate, pumping reductions  
19 during these critical vulnerability periods will  
20 demonstrably reduce entrainment and entrainment risk.  
21 See *id.* According to the BiOp, the piece-wise  
22 regression set forth in Figure B-14 of the BiOp was  
23 used to provide some indication of what level of  
24 exports would reduce entrainment during these first  
25 flush events, and not, as Plaintiffs assert, to analyze  
26 the impacts of salvage relative to the population. See  
27 BiOp at 350.

28 Doc. 660 at 23. The BiOp arguably supports the assertion that a  
"winter flush" can move smelt into areas of the delta where they  
are particularly vulnerable. See BiOp at 331. However, nothing  
in the discussion of the timing, characteristics, or indicators  
of the winter flush explains why -5,000 cfs was set as the

1 ceiling on negative OMR flows, rather than some other figure.  
2 That justification appears to come exclusively from Figures B-13  
3 and B-14, which rely upon the flawed analyses of raw salvage.

4 Finally, Federal Defendants attempt to justify the use of  
5 raw salvage numbers in calculating the -5,000 cfs ceiling by a  
6 convoluted argument that Kimmerer's work proves raw salvage  
7 trends generally follow population trends. Kimmerer's work did  
8 evaluate the population-level effects of project operations. The  
9 BiOp explains:  
10

11 This effects analysis evaluates the proposed action  
12 operations by exploring long-term trends in Delta  
13 outflow, or X2, and OMR flows during March-June and  
14 comparing these to hydrodynamic conditions expected  
15 based on CALSIM II modeling presented in the biological  
16 assessment. The analysis uses the larval-juvenile  
17 entrainment estimates provided by Kimmerer (2008) and  
18 flow and export projections from the biological  
19 assessment to estimate the annual percentages of the  
20 larval/juvenile delta smelt population expected to be  
21 entrained....

22 Kimmerer (2008) proposed a method for estimating the  
23 percentage of the larval-juvenile delta smelt  
24 population entrained at Banks and Jones each year.  
25 These estimates were based on a combination of larval  
26 distribution data from the 20-mm survey, estimates of  
27 net efficiency in this survey, estimates of larval  
28 mortality rates, estimates of spawn timing, particle  
tracking simulations from DWR's DSM-2 particle tracking  
model, and estimates of Banks and Jones salvage  
efficiency for larvae of various sizes. Kimmerer  
estimated larval-juvenile entrainment for 1995-2005. We  
used Kimmerer's entrainment estimates to develop  
multiple regression models to predict the proportion of  
the larval/juvenile delta smelt population entrained  
based on a combination of X2 and OMR.

25 BiOp at 219-220 (emphasis added). The BiOp used a similar  
26 approach for adult delta smelt:

27 Kimmerer (2008) calculated that entrainment losses of  
28 adult delta smelt in the winter removed 1 to 50 percent

1 of the estimated population and were proportional to  
2 OMR flow, though the high entrainment case might  
3 overstate actual entrainment. Given there are  
4 demonstrated relationships between smelt entrainment  
5 and salvage with OMR flows (Kimmerer 2008; Grimaldo et  
6 al. accepted manuscript), this effects analysis  
7 evaluates the proposed action operations by comparing  
8 the long-term trends in OMR flows to OMR flows in the  
9 CALSIM II modeling presented in the biological  
10 assessment. For both approaches, predictions of salvage  
11 and total entrainment losses were made using OMR flow  
12 since it was the best explanatory variable of each. The  
13 effects of proposed operations were determined by  
14 comparing actual salvage and entrainment losses with  
15 predictions of these parameters under modeled OMR  
16 flows.

17 BiOp at 211 (emphasis added). Kimmerer did calculate  
18 proportional population-level losses for both adults and  
19 juveniles. See *id.*; see also BiOp at 212, 250-252, 262  
20 (presenting model simulation results in Figures E4-E6 and E16  
21 which estimate proportional population losses based on  
22 entrainment). It is undisputed, however, that Kimmerer did not  
23 generate any operational metrics or attempt to calculate the  
24 point above or below which OMR flows would have particular  
25 effects on the smelt population. As a result, there was no basis  
26 to rely on Kimmerer's work alone to justify the specific OMR  
27 flows imposed by Actions 1 and 2. Federal Defendants point to a  
28 section of the BiOp's Effect's Analysis that concludes that  
because "over a given span of years, the project as proposed will  
increase larval/juvenile entrainment relative to 1995-2005  
levels," "[t]his will have an adverse effect on delta smelt based  
on their current low population levels." BiOp at 222. However,  
this conclusion references Figure E-18, which attempts to

1 estimate the likelihood of having an event that would entrain a  
2 significant proportion of the smelt population, thereby  
3 evaluating the effect of particular circumstances on the smelt  
4 population. See BiOp at 264. This language provides no support  
5 for Federal Defendants' assertion that the BiOp connects  
6 population level effects to raw salvage figures.  
7

8 Federal Defendants assert "Kimmerer (2008), like the BiOp,  
9 concluded that once raw entrainment numbers approach a certain  
10 level, population-level effects will occur." Doc. 660 at 25  
11 (citing BiOp at 159, 164-65, 210; AR at 18854-18880). Federal  
12 Defendants describe this as the "Kimmerer Approach," and argue:

13 The Kimmerer (2008) study shows that salvage trends  
14 generally follow population loss trends. See BiOp at  
15 206-207; see also AR at 18854-18880. Salvage data is  
16 then used to ascertain the pumping level at which  
17 entrainment risk can no longer be managed to a level  
that prevents harm to the population as a whole. See  
BiOp at 338. Using the Kimmerer approach, by managing  
salvage, the BiOp manages population-level losses.

18 Doc. 660 at 25. This description is not supported by the record.  
19 The BiOp does not rely upon Kimmerer (2008) or any other source  
20 to conclude that salvage trends generally follow population loss  
21 trends. This is FWS's invention to support its arbitrary flow  
22 limit.

23 FWS nowhere explains in the BiOp or the AR how the  
24 sporadically significant population-level effects identified in  
25 Kimmerer (2008) factored into the quantitative analysis that led  
26 to the -5,000 cfs OMR flow limit imposed in RPA Action 2.  
27  
28

1 Nowhere does the BiOp or the record explain how the analysis in  
2 Fig. B-13 "works in tandem" with the purported numeric results of  
3 Kimmerer (2008), and nowhere does the BiOp or the record state  
4 that Fig. B-13 was intended to create an "operational metric" to  
5 manage pumping to avoid "certain raw entrainment numbers." This  
6 is an abdication of the duty to satisfy the basic APA requirement  
7 that the agency "articulate[] a rational connection between the  
8 facts found and the choice made." *Ariz. Cattle Growers' Ass'n*,  
9 273 F.3d at 1236.

11 Federal Defendants argue that, even if FWS had used a scaled  
12 salvage index to calculate the OMR flow ceiling, the results  
13 would not have been appreciably different. For the purposes of  
14 demonstrating the difference between the analysis presented in  
15 the BiOp and a population-normalized analysis, Dr. Deriso  
16 analyzed the relationship between normalized salvage and OMR  
17 flows. He initially concluded that there is "no statistically  
18 significant relationship between OMR flows and adult salvage for  
19 flows less negative than -6,100 [cfs] at the very least." Deriso  
20 Decl., Doc. 401 at ¶¶ 62-65.<sup>19</sup> Federal Defendants' expert  
21 criticized Dr. Deriso's alternative analysis in a number of ways,  
22 including that Dr. Deriso failed to correct for potentially large  
23  
24

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25  
26 <sup>19</sup> Dr Deriso testified: "specifying that the ceiling on [OMR] flows  
27 should have been set at no lower than negative 6100 cfs" was stricken as post  
28 hoc extra record evidence. However, no party moved to strike Dr. Newman's  
similar, post hoc analysis. Dr. Deriso's analysis is considered here only as  
a counterpoint to Dr. Newman's, not to prove the validity of -6,100 as the  
appropriate ceiling.

1 sampling errors. Newman Decl., Doc. 484, at ¶ 12. Dr. Newman  
2 ran his own analysis, applying a different standard statistical  
3 methodology to the same data used by Dr. Deriso, and got  
4 different results regarding the "inflection point" where OMR  
5 flows had an increasing impact on the population-normalized  
6 salvage rate. *Id.* & Ex. C (identifying inflection point at -  
7 4,000 cfs, which is within the OMR flow target ranges established  
8 in the BiOp). Ultimately, however, Dr. Newman agreed that an  
9 analysis utilizing raw salvage numbers (i.e., not adjusted for  
10 relative population size) is scientifically inappropriate. *Id.*  
11 at ¶ 11. That other researchers were able to produce generally  
12 consistent inflection points through the use of more appropriate  
13 statistical methodologies does not excuse FWS's failure to do so.  
14 The difference between a -6,100 cfs ceiling and a -4,000 cfs  
15 ceiling is very substantial in the amount of lost annual water  
16 supply, with resulting adverse effects on human welfare and the  
17 human environment. FWS was required to perform an accurate  
18 scientific analysis and justify its ultimate decision regarding  
19 the imposition of a water flow ceiling.<sup>20</sup>

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20 Federal Defendants point out that the BiOp also relied on the 2006  
24 Manly and Chotkowski study, which found a statistically significant  
25 relationship between exports and smelt abundance as measured by Fall Midwater  
26 Trawl ("FMWT") catches, see AR 019672 (cited in BiOp at 156), as well as the  
27 Interagency Ecological Program's 2007 Synthesis Report on the Pelagic Organism  
28 Decline Team, which stated that "... entrainment of adults and larvae (top-  
down effects) are particularly important to the delta smelt population...."  
AR 016922 (emphasis added); see also Goude Decl., Doc. 470, at ¶¶ 6-7.  
However, none of these studies correlate raw salvage to population-level  
losses, nor do they otherwise justify the imposition of the particular flow

1 (2) Use of Raw Salvage Analyses in Justification  
2 for Action 3.

3 Action 3, which is designed to "[m]inimize the number of  
4 larval delta smelt entrained at the facilities by managing the  
5 hydrodynamics in the Central Delta..." limits net daily OMR flow  
6 to no more negative than -1,250 to -5,000 cfs, based on a 14-day  
7 running average with a simultaneous 5-day running average within  
8 25 percent of the applicable requirement for OMR. BiOp at 357.  
9 Action 3 establishes guidelines the SWG is to use when  
10 recommending where to set the OMR flow level within this range.  
11 *Id.* The BiOp anticipates that during most conditions, OMR flows  
12 will range between -2,000 and -3,500 cfs. *Id.* at n. 10. During  
13 certain years of higher or lower predicted "entrainment risk,"  
14 flows as low as -1,250 or as high as -5,000 may be recommended.  
15 *Id.*

16  
17 Plaintiffs do not challenge the basis for the low end of the  
18 range (-1,250 cfs) or the criteria used to formulate  
19 recommendations within the middle of the range. Plaintiffs do  
20 argue that the upper end of the range (-5,000 cfs) is based  
21 solely on FWS's raw salvage analysis and should be invalidated.  
22

23 The BiOp explains in the section of Attachment B addressing  
24 Action 3 that "[t]wo scenarios span the range of circumstances  
25 likely to exist during Action 3":  
26  
27

28 regime the BiOp imposes.

1 First, the low-entrainment risk scenario. There may be  
2 a low risk of larval/juvenile entrainment because there  
3 has been no evidence of delta smelt in the South and  
4 Central Delta or larval delta smelt are not yet  
5 susceptible to entrainment. *In this scenario, negative  
6 OMR flow rates as high as -5,000 cfs may occur as long  
7 as entrainment risk factors permit.*

8 The second scenario, the high-entrainment risk  
9 *scenario*, is one in which either (a) there is evidence  
10 of delta smelt in the South and Central Delta from the  
11 SKT and/or 20mm survey, or (b) there is evidence of  
12 ongoing entrainment, regardless of other risk factors.  
13 In this case, OMR should be set to reduce entrainment  
14 and/or the risk of entrainment as the totality of  
15 circumstances warrant.

16 Usually, if the available distributional information  
17 suggests that most delta smelt are in the North or  
18 North/Central Delta, then OMR flow can be chosen to  
19 minimize Central Delta entrainment. However, if the  
20 distributional information suggests there are delta  
21 smelt in the Central or South Delta, then OMR flows  
22 will have to be set lower to reduce entrainment of  
23 these fish. If delta smelt abundance is low,  
24 distribution cannot be reliably inferred. Therefore,  
25 the adaptive process is extremely important. The SWG  
26 may recommend any specific OMR flow within the  
27 specified range above.

28 BiOp at 358 (underlined emphasis in original; emphasis in italics  
added). The Action 3 discussion does not provide an independent  
justification for the choice of -5,000 cfs as the upper limit for  
OMR flows under the low entrainment risk scenario. Federal  
Defendants suggest that the upper limit is justified in the Delta  
Smelt OCAP Team's notes, which indicate that "[a]t -5,000 OMR,  
the model shows 40% entrainment at station 815." AR 009459.  
This is a reference to the PTM model results. There are two  
major problems with Federal Defendants' reliance on this



1 statement. First, it is contained within a section of the Delta  
2 Smelt OCAP Team notes entitled "Actions 1 and 2." AR 009457-60.  
3 Even if this statement was made in reference to Action 3, it does  
4 not justify using -5,000 cfs as the upper limit. The PTM study  
5 assumed an upper limit of -5,000 cfs and never considered any  
6 flow ranges above that. Nor is it made clear why 40% particle  
7 entrainment is a rational threshold of significance, as opposed  
8 to some lower or higher threshold. In sum, the PTM study does  
9 not justify the imposition of -5,000 cfs as an upper limit in  
10 Actions 1, 2, or 3.  
11

12 The "Action #3" section of the Team's notes does contain an  
13 explanatory statement regarding the source of the -5,000 cfs  
14 upper boundary for Action 3: "The -5,000 OMR cap was established  
15 by Wanger." AR 009463; see also AR 009462 ("[t]he group  
16 discussed the merits of using the -5,000 OMR per Wanger Order").  
17 It is unclear how FWS can rely directly on a provisional court  
18 order, entered as a remedial stopgap measure pending  
19 comprehensive scientific analysis, to establish the scientific  
20 basis for an RPA. The subject Order was the result of an Interim  
21 Remedies proceeding in the challenge to the previous Delta Smelt  
22 BiOp. After an evidentiary hearing, it was determined from the  
23 then available data that "the number of Delta smelt entrained at  
24 the CVP and SWP export facilities begins to rise significantly  
25 when negative flows on the OMR exceed approximately -5,000 cfs.  
26  
27  
28

1 [Tr. 641:14-642:5; 725:16-17; DWR Ex. D ¶ 4; DWR Ex. G ¶ 34; SWC  
2 Ex. N].” *NRDC v. Kempthorne*, 1:05-cv-1207, Doc. 561, Int. Rem.  
3 Findings, at ¶ 38. The finding was based on two studies of the  
4 relationship between OMR flows and smelt salvage: (1) a non-  
5 linear model presented by Sheila Greene of DWR; and (2) the  
6 linear model created by Peter Smith, which became the basis for  
7 Figure B-13. Both of these analyses utilized raw salvage data.  
8 AR 009251 (Green’s analysis); see also 1:05-cv-1207, Doc. 399,  
9 Decl. of Jerry Johns, Ex. B and C; 1:05-cv-1207, Doc. 419, Decl.  
10 of Christina Swanson, at 12, Fig. 8. That raw salvage studies  
11 were previously relied upon by the Court, when no others were  
12 available, does not validate their use in the 2008 Smelt BiOp.  
13  
14

15 d. FWS’s Comparison of CALSIM II Data to DAYFLOW  
16 Data.

17 The BiOp’s effects analysis used analytical methods and  
18 data, “including the CALSIM II model outputs provided in the  
19 appendices of Reclamation’s 2008 OCAP BA, historical hydrologic  
20 data provided in the DAYFLOW database, statistical summaries  
21 derived from 936 unique 90-day particle tracking simulations  
22 published by Kimmerer and Nobriga (2008), and statistical  
23 summaries and derivative analyses of hydrodynamic and fisheries  
24 data published by Feyrer et al. (2007), Kimmerer (2008), and  
25 Grimaldo et al. (accepted manuscript).” BiOp at 204.  
26

27 CalSim II is a computer model developed jointly by DWR and  
28

1 Reclamation. Declaration of Aaron Miller,<sup>21</sup> Doc. 548-1, at ¶ 5.  
2 The model simulates SWP and CVP operations and is the standard  
3 planning tool for evaluating project operations. *Id.* at ¶ 6.  
4 CalSim II has been continuously updated since it was first  
5 applied in 2002. *Id.* at ¶ 8. CalSim II simulates SWP and CVP  
6 reservoir operations, project exports and water deliveries, flow  
7 through the Delta, and salinity requirements in the Delta,  
8 including the location of X2. *Id.* at ¶ 7.

10 CalSim II uses historic hydrologic data from October 1922 to  
11 September 2003, including precipitation, runoff into reservoirs  
12 and inflow into the Delta from unimpaired streams. Miller Decl.,  
13 Doc. 548-1, at ¶ 10 & n.1. The model further assumes a level of  
14 development, which reflects water demand resulting from  
15 particular levels of urban population, agricultural production,  
16 and wildlife refuge needs, *id.* at ¶ 10, along with the effect of  
17 environmental regulations and programs, *id.* at ¶ 27; BiOp at 207.  
18 CalSim II is capable of estimating the position of X2. Miller  
19 Decl., Doc. 548-1, at ¶ 14.

21 The BiOp considered a number of CalSim II studies, either  
22 directly or indirectly:

- 23 • Study 6.0 was designed to represent the assumptions used  
24 in the 2004 OCAP BA within the updated CalSim II model

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26  
27 <sup>21</sup> Mr. Miller is DWR's Technical Senior Water Resource Engineer and  
28 possesses expertise in CALSIM II and Dayflow modeling. Miller Decl., Doc.  
548-1, at ¶¶ 1-3.

1 framework in order to highlight changes from the previous  
2 model framework. This Study models a 2005 level of  
3 development and includes steps to account for operations  
4 under CVPIA (b) (2) and Joint Point of Diversion<sup>22</sup>. See  
5 OCAP BA at 9-32 (AR 010729).

- 6
- 7 • Study 6.1 is similar to 6.0, except that the 2005 Trinity  
8 River Record of Decision is removed, and the Joint Point  
9 of Diversion is not accounted for. *Id.*
- 10 • Study 7.0 was developed as the baseline study for the  
11 OCAP BA. Study 7.0 represents existing conditions, and  
12 assumes a 2005 level of development and a full  
13 environmental water account ("EWA")<sup>23</sup>. BiOp at 207.
- 14 • Study 7.1 is a near-future conditions study. It assumes  
15 a 2005 level of development and a limited EWA. BiOp at  
16 207-08.
- 17 • Study 8.0 is a future conditions study. It assumes a  
18 2030 level of development and a limited EWA. BiOp at  
19 208.
- 20
- 21

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22 <sup>22</sup> State Water Resources Control Board Decision 1641 granted Reclamation  
23 and DWR the ability to "use/exchange each Project's diversion capacity  
24 capabilities to enhance the beneficial uses of both parties..." with certain  
25 conditions. BiOp at 26.

26 <sup>23</sup> The EWA was originally designed to compensate CVP and SWP contractors  
27 for loss of water to facilitate reduced diversions from the Delta at times  
28 when at risk fish species may be harmed. BiOp at 34. "Typically the EWA  
replaced water loss due to curtailment of pumping by purchase of surface or  
groundwater supplies from willing sellers and by taking advantage of  
regulatory flexibility and certain operational assets." *Id.* However, at the  
time the BiOp was issued, the agencies that manage the EWA were undertaking  
environmental review to determine the future of the EWA. *Id.* As a result,  
the BiOp treats EWA as a "limited" asset in some circumstances. *Id.*

- The 9.0 series of studies represents climate change scenarios. BiOp at 208.

The OCAP BA suggested using CalSim II Study 7.0 as the current baseline and Study 6.1 as the historical baseline for evaluating the impacts of project operations. BiOp at 204. However, the BiOp rejected this suggestion because, although “changes were expected between Study 6.1 and Studies 7.0 and 7.1,” the modeled results were “nearly identical.” *Id.* FWS concluded from this result that CalSim II could not accurately generate an empirical baseline. See *id.* at 204-06. Instead, FWS chose to “use actual data to develop an empirical baseline,” including the use of the Dayflow model to “develop[] historical time series data for hydrologic variables.” BiOp at 206. Dayflow is a model that estimates historic outflow based on historic precipitation, inflow, and exports, and estimates of delta island diversions. Dayflow also provides an estimate for the location of X2. Miller Decl., Doc. 548-1, at ¶¶ 14-15.

In the BiOp, FWS purports to quantify adult entrainment by comparing OMR flows from CalSim II studies to historic OMR flows during 1967-2007. BiOp at 212-13. The BiOp depicts these results in Tables E-5a, E-5b, and E-5c:

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**Table E-5a. Historic and CALSIM II modeled median winter (Dec-Mar) OMR flows by water year type**

Water year type	Historic	7	7.1	8	8	9	9.1	9.2	9.3	9.4	9.5
Wet	-1033	-5256	-5498	-5699	-5684	-5500	-3999	-3678	-7066	-6100	
Above Normal	-5178	-7209	-7923	-8073	-8156	-7595	-6863	-6934	-7861	-7723	
Below Normal	-2405	-6461	-7208	-7009	-6599	-6420	-5647	-6736	-6721	-6343	
Dry	-5509	-6443	-6931	-6692	-6620	-6353	-6831	-7438	-5785	-5760	
Critical	-5037	-4547	-4931	-4980	-5051	-4588	-5320	-5194	-4260	-3845	

**Table E-5b. Winter OMR Flow percent difference from historic median value to CALSIM II model median value**

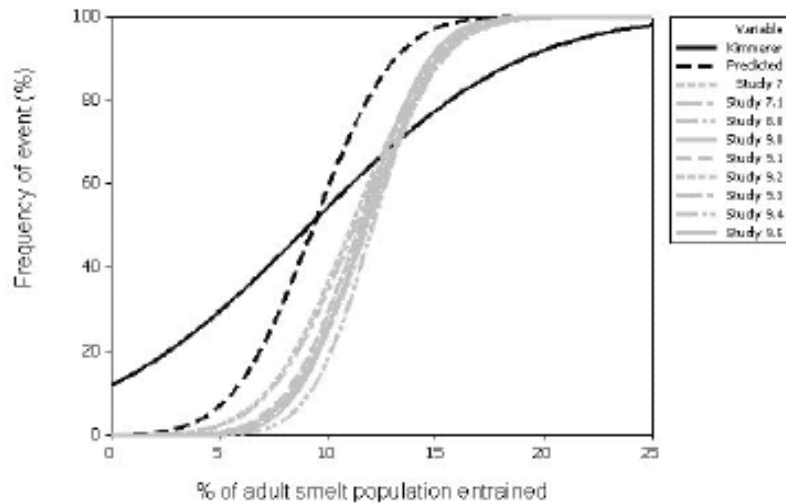
Water year type	7	7.1	8	9	9.1	9.2	9.3	9.4	9.5
Wet	408.92%	432.37%	451.84%	450.36%	432.50%	287.16%	256.13%	584.15%	490.63%
Above Normal	39.21%	53.01%	55.90%	57.49%	46.67%	32.53%	33.91%	51.80%	49.13%
Below Normal	168.62%	199.68%	191.41%	174.35%	166.90%	134.75%	180.05%	179.42%	163.72%
Dry	16.95%	25.81%	21.48%	20.17%	15.32%	24.01%	35.02%	5.01%	4.57%
Critical	-9.74%	-2.12%	-1.14%	0.27%	-8.92%	5.61%	3.11%	-15.44%	-23.68%

**Table E-5c. Percent difference from historic median salvage to predicted salvage based on Dec-Mar OMR flows from CALSIM II studies**

Water year type	Study 7	Study 7.1	Study 8	Study 9	Study 9.1	Study 9.2	Study 9.3	Study 9.4	Study 9.5
Wet	45.64%	48.26%	50.43%	50.26%	48.27%	32.05%	28.59%	65.20%	54.76%
Above Normal	15.15%	20.49%	21.60%	22.22%	18.04%	12.57%	13.10%	20.02%	18.99%
Below Normal	38.17%	45.20%	43.33%	39.46%	37.78%	30.50%	40.76%	40.61%	37.06%
Dry	6.80%	10.36%	8.62%	8.09%	6.15%	9.63%	14.05%	2.01%	1.83%
Critical	-3.70%	-0.81%	-0.43%	0.10%	-3.39%	2.13%	1.18%	-5.87%	-9.00%

1 Tables E-5b and E-5c depict changes in OMR flows and entrainment  
 2 using the Dayflow-generated historic data as the baseline and  
 3 comparing that to CalSim II study results. In addition, the BiOp  
 4 utilized an equation taken from Kimmerer's 2008 paper to estimate  
 5 the population loss of delta smelt under the various modeled  
 6 scenarios. The results of these calculations were depicted in  
 7  
 8 Figures E-5 and E-6:

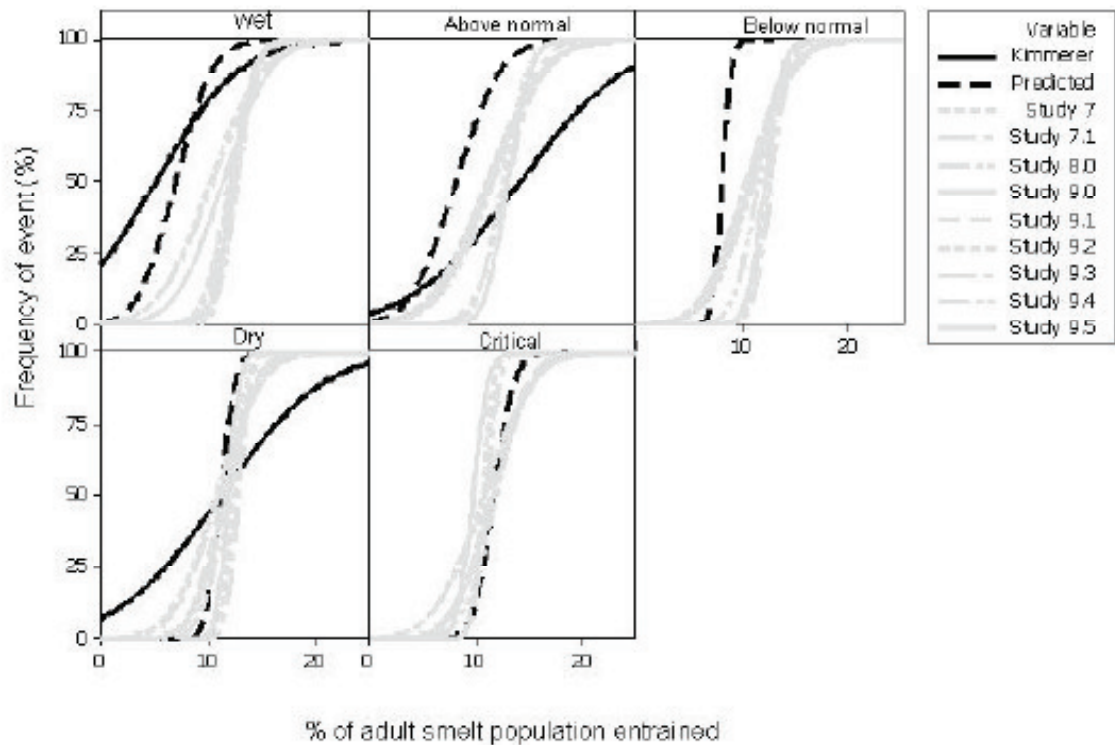
9  
 10 Figure E-5. Frequency distribution of predicted adult delta smelt entrained at Banks and  
 11 Jones for predicted estimates from historic data (1967-1994), actual estimates from  
 12 Kimmerer (2008) for years 1995-2006, and those estimated from CALSIM II model data  
 13 by study.



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Figure E-6. Same as E-5 but by water year type. Kimmerer (2008) estimates did not include below normal or critical dry water year types.



BiOp at 251-52. The accompanying text explains the significance of these results to the analysis:

The median OMR flows from the CALSIM II modeled scenarios were more negative than historic OMR flow for all WY types except critically dry years (Figure E-3; see Table E-5b for all differences). Overall, proposed OMR flows are likely to generate increases in population losses compared to historic years (Figure E-5 and Figure E-6). For example, the frequency of years when population losses are less than 10 percent from most modeled studies (except studies 7.0 and 8.0) is less than 24 percent compared to historic estimates that only exceed 10 percent in approximately half of the years.

The most pronounced differences occur during wet years, where median OMR flows are projected to be approximately 400 to 600 percent (-7100 to -3678 cfs)



1 higher than historical wet years (-1032 cfs).  
2 Generally, wet years are marked by low salvage and  
3 population losses. However, the proposed operations  
4 during wet year are predicted to cause up to a 65  
percent increase in smelt salvage and lower probability  
that population losses will be below 10 percent.

5 The proposed operation conditions likely to have the  
6 greatest impact on delta smelt are those modeled during  
7 above normal WYs. The modeled OMR flows for the above  
8 normal WYs ranged between -8155 and -6242 cfs, a 33 to  
9 57 percent decrease from the historic median of -5178  
10 cfs. Though the predicted salvage would only be about  
11 15-20 percent higher than historic salvage during these  
12 years (Table E-5c), the modeled OMR flows in these  
13 years would increase population losses compared to  
14 historic years.

15 In below normal and dry WYs, proposed OMR flows are  
16 also modeled to decrease from historic medians.  
17 Predicted salvage levels are likely to increase between  
18 2 and 44 percent. More importantly, the modeled median  
19 flows from all studies in these WY types range between  
20 -5747 and -7438 cfs. Modeled OMR flows at these levels  
21 are predicted to increase salvage and increase the  
22 population losses from historic levels as well.

23 During critically dry years, the median OMR flows for  
24 studies 7.0, 7.1, 8.0, 9.1, 9.4, and 9.5 are less than  
25 -5,000 cfs. These studies have predicted salvage lower  
26 than historic salvage and are not likely to generate  
27 larger population losses compared to historic years.  
28 The models might overestimate salvage during critical  
dry years when smelt are unlikely to migrate towards  
the Central Delta due to lack of turbidity or first  
flush. Thus, the effects of critical dry operations on  
delta smelt take are probably small and lower than  
estimated.

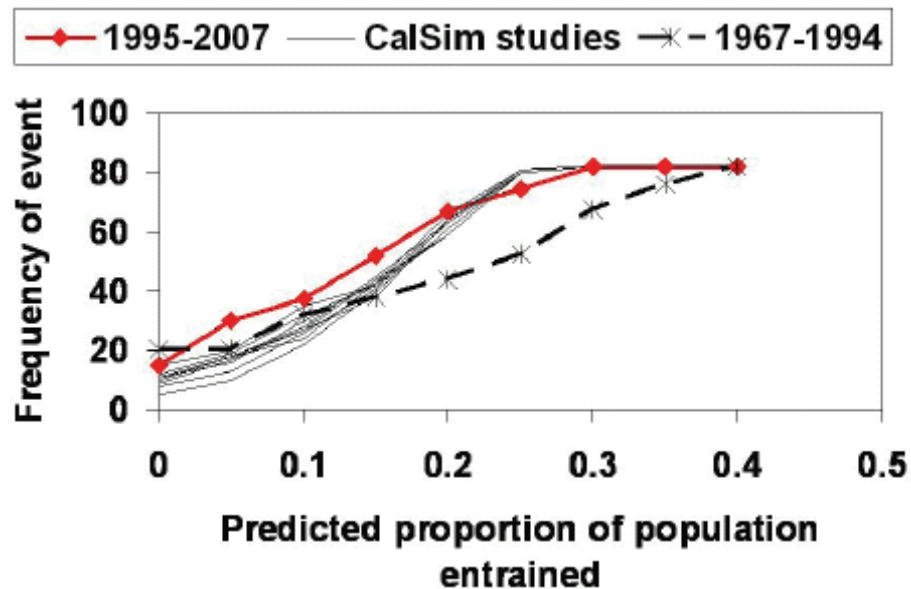
BiOp at 212-13.

Based on these comparisons of CalSim II data and Dayflow-  
generated historic data, the BiOp concludes, "adult entrainment  
is likely to be higher than it has been in the past under most  
operating scenarios, resulting in lower potential production of

1 early life history stages in the spring in some years." BiOp at  
 2 213.

3 The BiOp performed comparisons of CalSim II data to Dayflow-  
 4 simulated historic baseline data to quantify the effects of the  
 5 action on larval and juvenile delta smelt. See, e.g., BiOp at  
 6 219 (examining effect of action on larval and juvenile  
 7 entrainment: "[t]he analysis is based on comparison of historical  
 8 (1967-2007) OMR and X2 to the proposed action's predictions of  
 9 these variables provided in ... [CalSim] studies 7.0, 7.1, 8.0,  
 10 and 9.0-9.5"). Figure E-18 depicts several sets of calculations  
 11 of the frequency at which certain percentages of the delta smelt  
 12 population would be entrained:  
 13  
 14

15 Figure E-17. Frequency distribution of estimated proportions of larval-juvenile delta  
 16 smelt entrained at Banks and Jones for 1967-1994 and 1995-2007. The data were  
 17 extrapolated to an 82-year period to make them comparable to the CALSIM II out



18  
 19  
 20  
 21  
 22  
 23  
 24  
 25  
 26  
 27 BiOp at 264. The black dashed line depicts entrainment estimates  
 28 for Dayflow-generated historic data from 1967 to 1994, the red

1 line with diamonds depicts entrainment estimates for Dayflow-  
2 generated historic data from 1995-2007, and the fine lines depict  
3 the various entrainment estimates based on CalSim II data. Based  
4 on these calculations, the BiOp concludes that "the proposed  
5 action will decrease the frequency of years in which estimated  
6 entrainment is  $\leq$  15 percent. Thus, over a given span of years,  
7 the project as proposed will increase larval juvenile entrainment  
8 relative to 1995-2005 levels. This will have an adverse effect  
9 on delta smelt based on their current low population levels."

10  
11 BiOp at 222.

12 A separate BiOp analysis purports to quantify the effects of  
13 the project operations on delta smelt habitat by comparing CalSim  
14 II model projections of the location of X2 under the proposed  
15 operations to the median location of X2 over the historical  
16 period 1967-2007, as simulated by Dayflow. BiOp at 235-36.  
17 Based on this comparison, the BiOp concludes "[t]he median X2  
18 [locations] across the CalSim II modeled scenarios were 10-15  
19 percent further upstream than actual historic X2 (Figure E-19)."  
20 *Id.* at 235. In reliance on these percent differences between  
21 CalSim II-created data and historical data, the BiOp concludes:  
22 "proposed action operations are likely to negatively affect the  
23 abundance of delta smelt." *Id.* at 236.

24  
25  
26 According to Plaintiffs, the comparison of Calsim II to  
27 Dayflow outputs distorts the BiOp in several key ways:  
28

1 (1) The comparison of outputs of these two models in  
2 the Project Effects analysis is, *ipso facto*, a  
3 violation of the best available science requirement.

4 (2) To use Dayflow, which represents historical  
5 conditions, to generate the baseline for the Project  
6 Effects analysis, improperly attributes past effects to  
7 the Projects;  
8

9 (3) Because the flawed comparison was used to support  
10 imposition of Component 3 (Action 4) (a/k/a the "fall  
11 X2" action), that Action is invalid.<sup>24</sup>  
12

13 (1) Was FWS's Decision to Compare CalSim II to  
14 Dayflow Model Runs a Violation of the Best  
Available Science Requirement?

15 Mr. Aaron Miller opines that outputs from a CalSim II study  
16 should not be compared to outputs from the Dayflow model because  
17 the assumptions used in the two models are significantly  
18 different. Miller Decl., Doc. 548-1, at ¶¶ 22-55. He identified  
19 the following key differences between the models:  
20

- 21 • Level of Development: The CalSim II model assumes a  
22 constant level of development. In contrast, the  
23 Dayflow model incorporates a continuous change in the  
24

---

25 <sup>24</sup> In some of the briefs, this third argument is presented with  
26 Plaintiffs' other challenges to the Fall X2 action. It is most logical and  
efficient to address this issue with Plaintiffs' challenges to the use of the  
27 CalSim II versus Dayflow comparisons in the Project Effects Analysis.

28 Plaintiffs also argue that the BiOp improperly attributes all (or  
substantially all) of the observed, historical upstream shift of X2 to Project  
Operations. It is preferable to address these contentions with related  
arguments in Part VII.A.(6).

1 level of development because the Dayflow model is using  
2 historical information as input. When comparing models  
3 to determine the effect of project operations, the best  
4 scientific practice is to keep the assumed level of  
5 development constant. *Id.* at ¶¶ 31-38.

- 6
- 7 • Regulatory Assumptions: CalSim II assumes a constant  
8 regulatory environment, whereas Dayflow uses a  
9 regulatory environment that has changed over time.  
10 Over the past 40 years, numerous regulatory programs  
11 have altered the way the projects are operated,  
12 including D-1485, D-1641, the Central Valley Project  
13 Improvement Act ("CVPIA"), the 1995 Water Quality  
14 Control Plan, and the EWA. These differences "further  
15 undermine the reliability of comparing historically  
16 based Dayflow values to the Calsim II model results."  
17 *Id.* at ¶¶ 39-41.

- 18
- 19 • Time Step: CalSim II operates on a monthly time step,  
20 whereas Dayflow operates on a daily time step. *Id.* at  
21 ¶ 42.

- 22
- 23 • Operational/Computational Guidelines: The Dayflow  
24 model incorporates real-world conservative operational  
25 tactics designed to avoid violating applicable  
26 regulations. In contrast, the CalSim II model operates  
27 strictly to that regulation. *Id.* at ¶ 44. Operating  
28

1 conservatively results in higher modeled outflow. *Id.*

- 2 • Year Range: The Dayflow model uses a different historic  
3 time window than CALSIM II. The BiOp used values from  
4 1967 to 2007 as inputs into the Dayflow model, while  
5 1922 to 2003 were used for Calsim II. *Id.* at ¶ 52.  
6 This introduces additional error into any comparison  
7 between outputs of these two models because the time  
8 period used for the Dayflow model had a higher  
9 percentage of wet or above normal years, as compared to  
10 the time period covered by Calsim II. *Id.* at ¶ 53.
- 11 • Method for Calculating position of X2: The artificial  
12 neural network ("ANN") and the Kimmerer Monismith  
13 equation ("KM equation") are two methods of estimating  
14 X2. *Id.* at ¶ 46. The CalSim II studies used ANN to  
15 estimate the position of X2, while the Dayflow model  
16 uses the KM equation. *Id.* at ¶ 47. Holding all other  
17 variables constant, but varying the method (ANN v. KM)  
18 used, produces inconsistent results. At locations less  
19 than 75 kilometers ("km") from the Golden Gate, the KM  
20 equation results in an X2 estimate greater than (or  
21 farther upstream than) the ANN estimate. In contrast,  
22 at locations greater than 75 km from the Golden Gate,  
23 the KM equation provides an estimate less than the ANN  
24 estimate. *Id.* at 11, Fig. 2.

1 Mr. Miller opined that best scientific practice is to  
2 compare models that use consistent assumptions and methodologies.  
3 See *id.* at ¶¶ 38, 51, 54; see also *id.* at ¶ 41. The approach  
4 taken in the BiOp, quantitatively comparing Calsim II runs to  
5 Dayflow model outputs "introduces significant error into the  
6 analysis." *Id.* at ¶ 56.  
7

8 Dr. Punt, a 706 Expert added that "[i]n principle, there is  
9 nothing wrong with fitting a model using a set of OMR/X2 valued  
10 from one model and making predictions using OMR/X2 values which  
11 are based on the output from a different model, as long as the  
12 two sets of values are calibrated.... Not calibrating the two  
13 sets of model outputs will lead to some bias in the inferences,  
14 with the level of bias dependent on the net effect of all the  
15 differences between the 'historical' and Calsim II values for the  
16 same years." Doc. 633-1 at 15.  
17

18 Mr. Derek Hilts, a FWS employee who previously served as  
19 "Engineer-in-Charge" of CVP/SWP modeling for Reclamation,  
20 disagrees with Mr. Miller's general opinion that comparing Calsim  
21 II and Dayflow outputs is *per se* scientifically unreliable,  
22 noting that the OCAP BA's Appendix D specifically compared Calsim  
23 II and Dayflow runs for the purposes of testing "Calsim II's  
24 ability to simulate the CVP/SWP system reasonably well." Decl.  
25 of Derek Hilts, Doc. 540, at ¶ 11. But, as Mr. Miller explains,  
26 this type of "validation comparison" is designed to "help  
27  
28

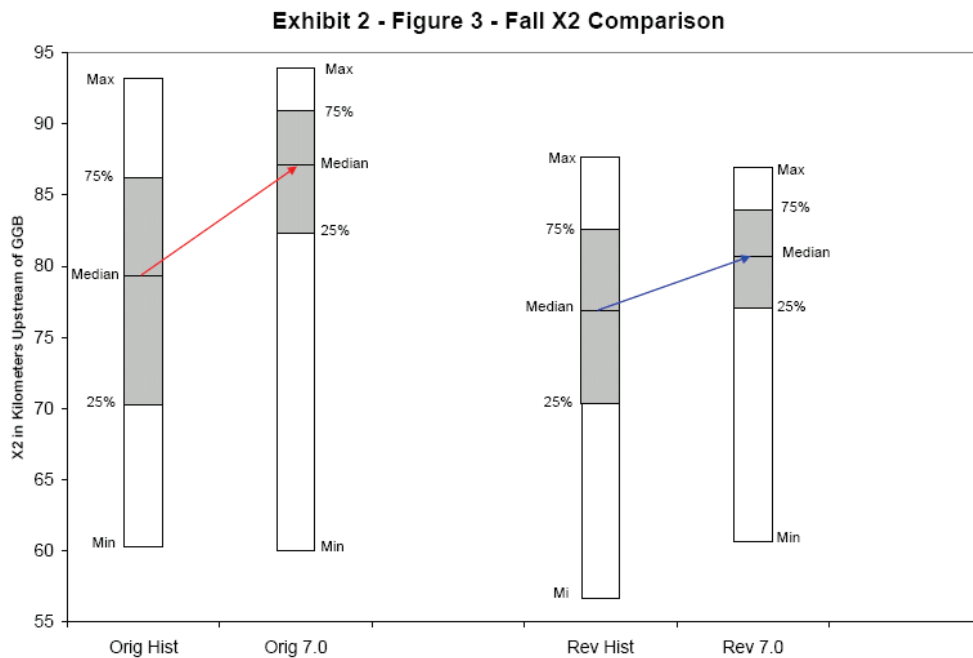
1 establish the credibility of the CalSim II model by showing that  
2 the model moves water, simulates operation of the export pumps,  
3 and so forth, with the same general timing and magnitude as  
4 actual historical data show." Second Miller Decl., Doc. 597, at  
5 ¶ 12. In fact, Mr. Miller points out that the detailed  
6 validation data contained in the OCAP BA demonstrate that,  
7 although Calsim II outputs generally track historical data, they  
8 "do not precisely match the actual historical data." *Id.* at ¶  
9 12. Because validation is "looking only at the general  
10 operational performance of the model," a validation comparison  
11 "does not need to control for the effects of all the differences  
12 in the model and the historical measurements...." *Id.* at ¶ 13.

14  
15 More specifically, Mr. Hilts disagrees with Mr. Miller's  
16 critique that the divergent methods of calculating the position  
17 of X2 render the comparison used in the BiOp scientifically  
18 inappropriate. Mr. Hilts does not dispute Mr. Miller's  
19 conclusion that the KM and ANN equations produce marginally  
20 different outcomes. Instead, Mr. Hilts criticizes Mr. Miller for  
21 failing to "assert that any such error would have changed the  
22 conclusions drawn in the BiOp." Doc. 540 at ¶ 19.

23  
24 Assumedly to demonstrate that the conclusion would not have  
25 changed, Mr. Hilts revisited the calculations in the BiOp, using  
26 the KM equation in both models to produce revised estimates of  
27  
28



1 the position of X2.<sup>25</sup> In performing this analysis, Mr. Hilts also  
 2 attempted to correct for one of the other purported sources of  
 3 bias -- the inconsistent year range -- as well as for a few  
 4 incorrect data points found in the underlying data used in the  
 5 BiOp. Doc. 540 at ¶¶ 17-18. This revised analysis, which is  
 6 presented in Exhibit 2, Figure 2 to Mr. Hilts' declaration, is  
 7 replicated below:  
 8



21 Doc. 540, Exhibit 2, Figure 2. According to Mr. Hilts, this  
 22 figure demonstrates the "same general upstream movement" of X2  
 23 "discussed in the 2008 BiOp." *Id.* at ¶ 17.<sup>26</sup>  
 24

25 <sup>25</sup> Mr. Hilts chose to use KM instead of ANN because "[w]orking with ANN  
 26 is very complex"; "using ANN to estimate X2 had just been introduced to Calsim  
 27 II when the 2008 OCAP BA was completed"; and "few outside DWR know how to work  
 28 with [ANN]." Doc. 540 at ¶ 15.

<sup>26</sup> Mr. Miller rejoins that Mr. Hilts' revised analysis contains several  
 errors. See Doc. 597 at ¶ 18(b)-(c). Even assuming, *arguendo*, Mr. Hilts'  
 analysis was accurately performed, the comparison of Calsim II to Dayflow

1           Recognizing that his revised analysis demonstrates the same  
2 general upstream shift as the BiOp, Mr. Hilts criticizes Mr.  
3 Miller for failing to "quantify the effect of the alleged biases  
4 ostensibly embedded in the X2 comparison presented in the BiOp."  
5 *Id.* at ¶ 7. Federal Defendants contend that even if the CalSim  
6 II to Dayflow comparison introduced bias, that bias was not  
7 significant. However, the record suggests otherwise.  
8

9           Recognizing that it is not possible to quantify all aspects  
10 of the error caused by the comparison of CalSim II runs to  
11 Dayflow output, Mr. Miller's reply declaration endeavored to  
12 quantify the bias in his reply declaration. See Second Miller  
13 Decl., Doc. 597. As with Mr. Hilts' revised calculations, Mr.  
14 Miller compared the results reported in the BiOp (CalSim II runs  
15 applying the ANN equation and Dayflow runs using the KM  
16 equation), to a revised set of results using the KM equation  
17 instead of ANN in the CalSim II runs. *Id.* at ¶ 14. Mr. Miller's  
18 analysis shows that project operations will cause an upstream  
19 shift in X2. Mr. Miller explained that the BiOp's comparison  
20 reflected a difference between the reported historic median of X2  
21 [79 km] and the study 7.0 median [87 km] of 10% [(87 km - 79  
22 km)/79]. Mr. Miller concluded that the median X2 for the CalSim  
23 7.0 study using the KM equation (instead of using ANN) was 84 km  
24 (instead of 87 km). Finally, he identified the percent  
25  
26  
27

28 generates significant bias that is not addressed in the BiOp.

1 difference between the reported historic median estimate of X2  
2 using the KM equation [79 km] and the CalSim study 7.0 median  
3 estimate of X2 using the KM equation [84 km] to be 6% [(84 km-79  
4 km)/79 km]. *Id.* at ¶ 14; BiOp at 235-36. From this, Mr. Miller  
5 concluded 40% of the difference between X2 as estimated by study  
6 7.0 and the historical X2 baseline reported in the BiOp is error  
7 attributed entirely to the use of the KM equation to calculate  
8 the historical baseline X2 and the ANN equation to calculate the  
9 CalSim II study 7.0 results. *Id.* at ¶ 15. It is unknown which  
10 portion of the remaining 60% of difference is attributable to the  
11 proposed action, and which portion is due to the other identified  
12 biases. *Id.* at ¶ 16. Dr. Punt expressed a corroborating  
13 opinion, estimating that the bias created by failing to calibrate  
14 the models "seems non-trivial" and opining that it could be "as  
15 large as the differences seen in Figure E-19," the figure in the  
16 BiOp depicting the purported 10% shift in X2 between the  
17 historic/Dayflow runs and the Calsim II runs. Doc. 633-1 at 16.

18  
19  
20 Following a similar methodology, using the BiOp's Figure E-  
21 20 equation, Mr. Miller calculated the reduction in suitable  
22 habitat consistent with the change in the position of X2. A  
23 comparison of CalSim II study 7.0 with study 7.1 yielded a  
24 reduction in habitat area of 128 hectares (or 2.8%), and a  
25 comparison of study 7.0 with study 8.0 yielded a reduction in  
26 habitat area of 289 hectares (or 6.2%). Doc. 597 at ¶ 20; BiOp  
27  
28

1 at 266.

2 Mr. Miller opined that all errors/biases could have been  
3 avoided by comparing CalSim II study 7.0 -- designed as a current  
4 conditions baseline -- instead of the "historical" baseline in  
5 the BiOp, to the near-future 7.1 study.<sup>27</sup> However, Mr. Hilts  
6 points out that comparing Calsim II Study 7.0 to 7.1 and 8.0 is  
7 simply "not responsive to the need for comparisons with  
8 historical X2 locations," because none of the Calsim II  
9 simulations represent Delta conditions that existed from 1967 -  
10 2007. Doc. 540 at ¶ 9. "With the Fall X2 comparison, [FWS  
11 wanted to investigate whether the continuation of the recent, as  
12 well as future, CVP/SWP operations would result in less or  
13 deteriorated habitat for delta smelt relative to the habitat that  
14 prevailed historically." *Id.* at ¶ 8. "The CalSim II simulations  
15 that Mr. Miller would have the FWS use do not" accomplish this.  
16  
17  
18 *Id.*

19 The theoretical problems with using a Calsim II to Calsim II  
20 comparison were manifest. As discussed above, when CalSim II was  
21 used to model current Project operations, and these results were  
22 then compared to the results of a CalSim II modeling run  
23 purportedly simulating past operations, the results "were nearly  
24

---

25 <sup>27</sup> Mr. Miller performed a Calsim II to Calsim II comparison. The results  
26 indicate a 0.7 km upstream movement of X2, with a 0.8% change in X2 from  
27 current to near-current conditions. In a comparison of Calsim II Study 7.0 to  
28 Study 8.0 (a 2030 level of development scenario), X2 moved upstream only 1.1  
km (1.2 % change). Doc. 597 at ¶20; BiOp at 235, 265. In contrast, the BiOp  
estimated approximately 8.7 km and 9.1 km changes, respectively, using Dayflow  
data as the baseline. BiOp at 265 (Figure E-19).

1 identical" despite significant operational changes in current  
2 operations as compared to past. BiOp at 204-205. The BiOp  
3 explains that "[t]he inaccuracies in CalSim [led FWS] to use  
4 actual data to develop an empirical baseline." *Id.* at 206.<sup>28</sup> FWS  
5 contends it had legitimate reasons to rely on a Calsim II to  
6 Dayflow comparison instead of a Calsim II to Calsim II  
7 comparison.  
8

9 In light of the known and material resulting disparity,  
10 FWS's decision to use a Calsim II to Dayflow comparison to  
11 quantitatively justify its jeopardy and adverse modification  
12 conclusions, without attempting to calibrate the two models or  
13 otherwise address the bias created, was arbitrary and capricious  
14 and ignored the best available science showing that a bias was  
15 present. The BiOp specifically relied upon the quantitative  
16 nature of the Calsim II to Dayflow comparisons in many places.  
17 For example, in reference to the X2 shift and resulting effects  
18 on smelt habitat:  
19

20 The median X2 across the CALSIM II modeled scenarios  
21 were 10-15 percent further upstream than actual  
22 historic X2 (Figure E-19). Median historic fall X2 was  
23 79km, while median values for the CALSIM II modeled  
24 scenarios ranged from 87 to 91km. The CALSIM II modeled  
25 scenarios all had an upper range of X2 at about 90km.  
26 The consistent upper cap on X2 shows that water quality

---

26 <sup>28</sup> The Independent Peer Review of the BiOp's Effects Analysis also noted  
27 and was "surprised at" the fact that the historical baseline "differed  
28 greatly" from CalSim II Study 7.0 simulated results. AR 008817. The Peer  
Review reasoned that this discrepancy "raises the question of how  
representative Study 7.0 is of current and near-future conditions." *Id.*

1 requirements for the Delta ultimately constrain the  
2 upper limit of X2 in the simulations. These results  
3 were also consistent across WY types (Figure E-19) with  
4 the differences becoming much more pronounced as years  
5 became drier. Thus, the proposed action operations will  
6 affect X2 by shifting it upstream in all years, and the  
7 effect is exacerbated in drier years.

8 BiOp at 235. The BiOp does not explain to what extent the  
9 ultimate jeopardy/ adverse modification conclusions were based  
10 upon the calculated magnitude (10-15 percent) of the X2 shift,  
11 rather than the existence of a shift. It cannot be determined  
12 whether the BiOp would have reached the same conclusion had this  
13 bias not been present.

14 Federal Defendants concede but understate that "the two  
15 models are not perfectly calibrated, and a slight transformation  
16 of the data occurs when the analysis switches from one model to  
17 the other, the BiOp acknowledges this slight shift." Doc. 660 at  
18 36. Nevertheless, FWS concluded in its "scientific judgment []  
19 that the CalSim [II]-to-Calsim [II] output was far worse." *Id.*  
20 (citing BiOp at 207). Federal Defendants argue this was a choice  
21 between "one comparison that yielded a slight calibration issue  
22 and another that completely masked altogether the variable sought  
23 to be compared...." and that "it would have been irrational for  
24 the Service to proceed with [a Calsim II to Calsim II comparison"  
25 after discovering its flaws. *Id.* This may be the case, but it  
26 does not follow that what FWS did with the Calsim II to Dayflow  
27 comparisons was rational or based upon the best available  
28

1 science.

2 FWS had actual notice of scientific concerns with comparing  
3 historical data to CalSim II simulated data. DWR Deputy Director  
4 Jerry Johns, on October 24, 2008, submitted comments to FWS on  
5 the draft effects analysis, generally cautioning against the  
6 comparison of modeled data with actual data:  
7

8 USFWS is using historic data for comparison to CalSim  
9 II simulations. Great caution should be taken when  
10 comparing actual data to modeled data. CalSim II  
11 modeling should be used in a comparative mode. In other  
12 words, it should be used to compare one set of model  
13 runs to another. For example, it would be appropriate  
14 to compare CalSim II modeling of one demand alternative  
15 to another to analyze the incremental effects.

16 AR 008671; see also AR 008668 (further explaining unreliability  
17 problems comparing historic and modeled data). Although neither  
18 Mr. Miller nor any interested party suggested that comparing  
19 Dayflow to Calsim II data was a scientifically invalid  
20 methodology prior to the issuance of the BiOp, the BiOp does not  
21 recognize the essential methodological defect, or explain how any  
22 of the conclusions it reached account for it. Nor does the BiOp  
23 explain how it is able to attribute the changes in X2 it found  
24 between the "historic" baseline and the CALSIM studies to the  
25 proposed action, and not to any of the other differences between  
26 the Dayflow and Calsim II models. Instead, FWS only rationalizes  
27 that it opted to use the "historic" baseline rather than CALSIM  
28 Study 7.0 as the baseline because, "the CALSIM monthly simulation  
model does not capture a precise Delta operation.... [Thus], the

1 inaccuracies in CALSIM lead us to use actual data to develop an  
2 empirical baseline." BiOp at 204 & 206. This statement may  
3 explain the reasons for FWS's decision, but it does not justify  
4 its ultimate conclusion.

5 This is of particular concern because DWR, a joint operator  
6 of the projects communicated its scientific and operational  
7 concerns based on known available science. DWR and Reclamation  
8 have legal obligations to allocate water supply reasonably and  
9 responsibly, not solely to save the species. As discussed in  
10 below at Part VII.B, FWS's focus on its responsibilities to the  
11 species appears to have caused it to ignore its own regulations'  
12 obligations to consider impacts to the overall water supply and  
13 additional uses. The potential impacts of inaccurate  
14 quantitative analyses in the BiOp cannot be understated.

15  
16  
17 Defendants argue FWS's decision to compare the two models to  
18 quantify the shift of X2 was a reasonable scientific decision,  
19 even though other experts may disagree. Doc. 660 at 17-19; Doc.  
20 661-3 at 13-14. Federal Defendants cite *Lands Council*, 537 F.3d  
21 at 993, to justify FWS's modeling decisions as entitled to  
22 deference, because it is a matter "within its area of special  
23 expertise, at the frontiers of science."<sup>29</sup> As a general rule,  
24

---

25  
26 <sup>29</sup> *Lands Council* also held that an agency is not required "to conduct any  
27 particular test or to use any particular method, so long as 'the evidence ...  
28 provided to support [its] conclusions, along with other materials in the  
record,' ensure that the agency 'made no clear error of judgment that would  
render its action arbitrary and capricious.'" *League of Wilderness Defenders-*



1 choices regarding modeling methods are exactly the sort of  
2 choices that, under the APA, are left to the expert agency in the  
3 exercise of its discretion. *NWF v. EPA*, 286 F.3d at 565. A  
4 court "may reject an agency's choice of a scientific model only  
5 when the model bears no rational relationship to the  
6 characteristics of the data to which it is applied." *Id.* at 565  
7 (internal quotations and citations omitted). *Lands Council*  
8 instructs that a court is "not free to impose on the agency [its]  
9 own notion of which procedures are best.... Nor may [it] impose  
10 procedural requirements not explicitly enumerated in the  
11 pertinent statutes." 537 F.3d at 993 (internal citations and  
12 quotations omitted); *id.* at 1000 (finding agency did not act  
13 arbitrarily "in relying on its own data and discounting the  
14 alternative evidence offered" by plaintiffs because "[w]hen  
15 specialists express conflicting views, an agency must have  
16 discretion to rely on the reasonable opinions of its own  
17 qualified experts even if, as an original matter, a court might  
18 find contrary views more persuasive") (citations omitted).

19  
20  
21 In *NWF v. EPA*, the EPA evaluated several regulatory options  
22 for economic feasibility, applying a particular model to predict  
23

---

24 *Blue Mountains Biodiversity Project v. U.S. Forest Serv.*, 549 F.3d 1211, 1218  
25 (9th Cir.2008) (quoting *Lands Council*, 537 F.3d at 993). But *Lands Council*  
26 and *Blue Mountains Biodiversity Project* arose under the National Forest  
27 Management Act ("NMFA") and/or the National Environmental Policy Act ("NEPA"),  
28 neither of which include the additional requirement, found in the ESA, that  
the agency use the "best available science." Although *Lands Council's* general  
holding that a court must be deferential to an agency's choice of methodology  
in an area of its expertise, the agency is not free to ignore the best  
available science.

1 whether businesses were likely to go bankrupt under the weight of  
2 additional regulation. NWF criticized the model on several  
3 grounds, including that the model had "an error rate of at least  
4 15%." *Id.* at 565. The D.C. Circuit examined and rejected each  
5 critique, reasoning that none called into question the model's  
6 reliability. *Id.*

7  
8 Here, however, undisputed expert testimony offered by DWR, a  
9 co-operator of the Projects, calls into question the manner by  
10 which FWS utilized the two models to evaluate the impact of  
11 project operations on the position of X2. The Calsim II model  
12 was developed by DWR and Reclamation as a planning tool to  
13 simulate State Water Project and Central Valley Project  
14 operations. DWR, one of the agencies with special expertise in  
15 the use and application of Calsim II, see BiOp at 207; Miller  
16 Decl., Doc. 548-1, at ¶ 5-7, raised cautions and objects to the  
17 manner in which FWS used the model. Federal Defendants do not  
18 rebut the undisputed expert evidence that using such comparisons  
19 for quantitative purposes is scientifically improper. All  
20 experts in this case agree that data from two different models  
21 should not be compared without calibration. Doc. 633-1 at 13-17  
22 (706 expert report); Miller Decl., Doc. 548-1, ¶¶ 22-55; Second  
23 Miller Decl., Doc. 597, ¶¶ 4-22. In other words, even though no  
24 superior set of models have been identified, the chosen models  
25 were indiscriminately used without addressing an important factor,  
26  
27  
28

1 the potential (and apparently real and significant) bias created  
2 when the results of two different computer models were used to  
3 perform quantitative comparisons. Unlike *NWF v. EPA*, where the  
4 agency applied a model that was deemed reliable, here, FWS has  
5 not addressed or explained the material bias created by its  
6 methodological choices. It cannot be determined whether FWS  
7 would have reached the same result had the bias been considered  
8 or addressed. FWS must do so on remand.

10  
11 (2) Does the Use of Dayflow to Represent the  
12 Baseline in the Project Effects Analysis  
13 Improperly Attribute Past Effects to the  
14 Projects?

15 DWR asserts that FWS's use of an "historical baseline" was  
16 per se unlawful because the ESA's implementing regulations  
17 "require the Service to use current operations, not past  
18 operations, as the baseline for its effects analysis." Doc. 548  
19 at 7-8. In support of this contention, DWR cites 50 C.F.R. §  
20 402.02, which defines the "environmental baseline" to include:

21 the past and present impacts of all Federal, State, or  
22 private actions and other human activities in the  
23 action area, the anticipated impacts of all proposed  
24 Federal projects in the action area that have already  
25 undergone formal or early section 7 consultation, and  
26 the impact of State or private actions which are  
27 contemporaneous with the consultation in process.

28 See also Consultation Handbook at 4-22 (baseline includes  
"effects of past and ongoing human and natural factors leading to  
the current status of the species") (emphasis added). In  
addition, DWR cites *NWF v. NMFS II*, 524 F.3d at 930, which held

1 that an agency action "only 'jeopardize[s]' a species if it  
2 causes some new jeopardy." (Emphasis added.) DWR argues that  
3 "[b]ecause [FWS's] baseline looks to decades past, it cannot be  
4 used as a basis for assessing any 'new jeopardy' posed by Project  
5 operations going forward." Doc. 548 at 8.<sup>30</sup>

6  
7 DWR oversimplifies the issue. FWS's BiOp sought to  
8 determine whether ongoing and future coordinated operations of  
9 the CVP and SWP would cause jeopardy to the delta smelt or  
10 adversely affect its critical habitat. Arbitrarily setting the  
11 baseline at 2008, when the BiOp's analysis was finalized, would  
12 not have captured the impacts of then-ongoing project operations.  
13 The agency had discretion to use a historic baseline.

14  
15 (3) Use of Comparisons Between CALSIM and DAYFLOW  
16 Model Outputs to Justify Imposition of  
17 Component 3 (Action 4), the Fall X2 Action.

18 In addition to utilizing comparisons of Calsim II and  
19 Dayflow data in the Project Effects section to demonstrate that  
20 Project Operations affect the location of X2, the BiOp relies on  
21 these comparisons to justify the imposition of RPA Component 3  
22 (Action 4, or the "Fall X2 action"). The BiOp's "Justification"  
23 section discussing Action 4 references the Calsim II to Dayflow  
24 comparison:

25  
26 <sup>30</sup> Plaintiffs advance the related argument that FWS's use of a historic  
27 baseline caused FWS to mix the effects of the OCAP with the effects of all the  
28 other changing factors that occurred during the historical period of 1967 to  
2007 represented by the Dayflow data. Doc. 551 at 24. However, the post-  
record expert testimony provided in support of this argument was stricken.  
Doc. 750 at 3, at ¶9.

The Effects section clearly indicates there will be significant adverse impacts on X2, which is a surrogate indicator of habitat suitability and availability for delta smelt in all years (Figures E-19 and E-25 in Effects section).... The action is focused on wet and above normal years because these are the years in which project operations have most significantly adversely affected fall (Figure E-27 in Effects section) and therefore, actions in these years are more likely to benefit delta smelt.

BiOp at 373. Figures E-19 and E-25 compare historic X2 locations simulated by Dayflow to conditions under planned project operations simulated by CalSim II:

Figure E-19. X2 (km) during September to December based on historic data and CALSIM II model results. The center line in the box is the median and the outer box boundaries are the first and third quartiles.

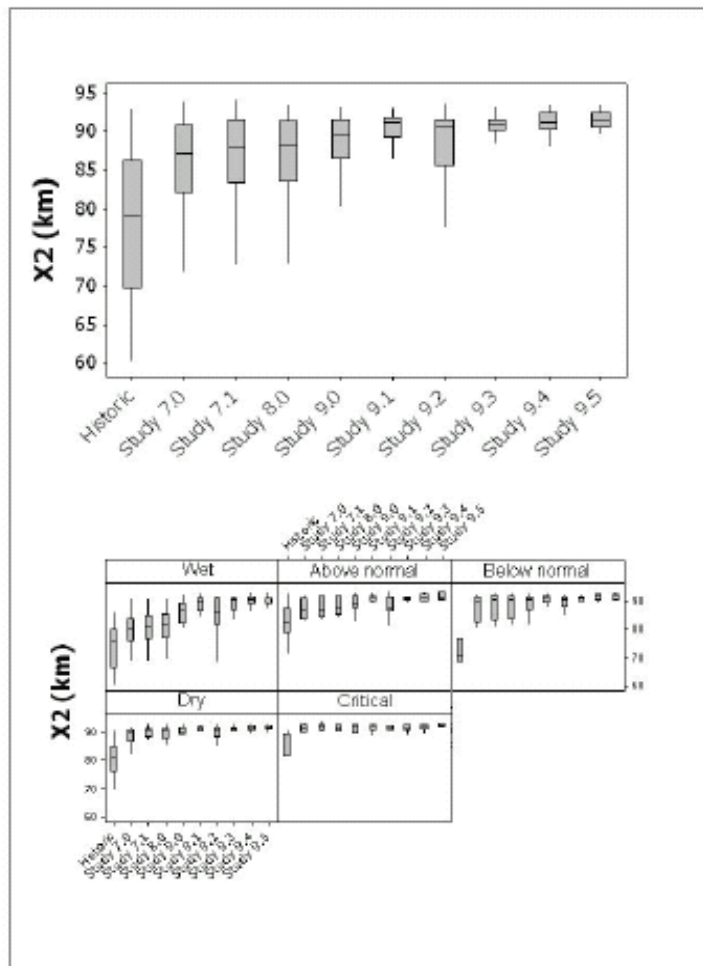
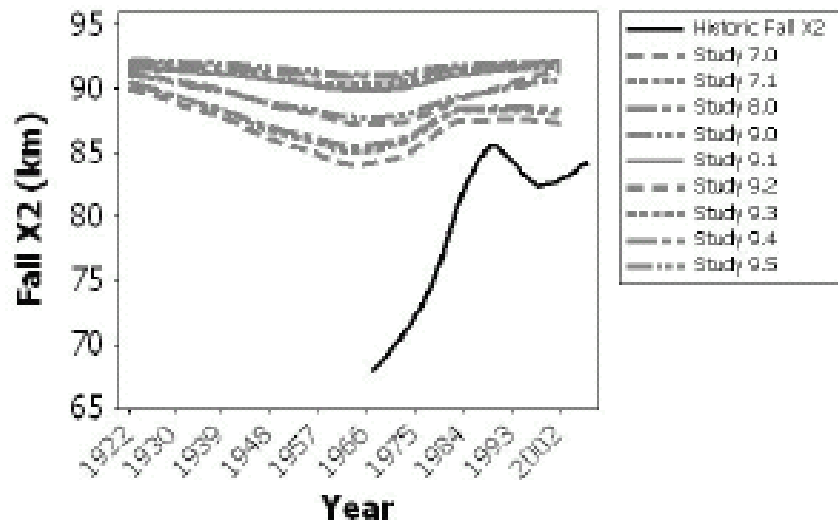


Figure E-25. Smoothed trend lines for the time series of historic and CALSIM II-modeled fall X2.



BiOp at 265, 271.

Undisputed expert testimony establishes the likelihood that the comparison of Dayflow to Calsim II data introduced significant error into the analysis that forms the basis for Figures E-19 and E-25. Mr. Miller concluded 40% of the difference between X2 as estimated by study 7.0 and the historical X2 baseline reported in the BiOp is error attributed entirely to the use of the KM equation to calculate the historical baseline X2 and the ANN equation to calculate the CalSim II study 7.0 results. Second Miller Decl., Doc. 597, at ¶ 15. It is unknown which portion of the remaining 60% of difference is attributable to the proposed action, and which portion is due to the other identified biases. *Id.* at ¶ 16. Dr. Punt gave a consistent opinion, estimating that the bias created by failing to calibrate the models "seems non-trivial" and

1 opining that it could be "as large as the differences seen in  
2 Figure E-19," the figure in the BiOp depicting the shift in X2  
3 between the historic/Dayflow runs and the Calsim II runs. Doc.  
4 633-1 at 16.

5 Federal Defendants do not respond directly to these  
6 assertions of bias. Instead, they point out that the historical  
7 X2 data was not the only basis for Action 4. Doc. 660 at 49.  
8 The BiOp describes multiple sources of information that were  
9 considered:  
10

11 This analysis of the effects [of the] proposed CVP and  
12 SWP operations on the delta smelt and its critical  
13 habitat uses a combination of available tools and data,  
14 including the CALSIM II model outputs provided in the  
15 appendices of Reclamation's 2008 Biological Assessment,  
16 historical hydrologic data provided in the DAYFLOW  
17 database, statistical summaries derived from 936 unique  
18 90-day particle tracking simulations published by  
19 Kimmerer and Nobriga (2008), and statistical summaries  
20 and derivative analyses of hydrodynamic and fisheries  
21 data provided by Feyrer et al. (2007), Kimmerer (2008),  
22 and Grimaldo, et al. (accepted manuscript).

23 BiOp at 204; see also Feyrer Decl., Doc. 541, at ¶ 17.

24 Additionally, "[t]he Service's examination of habitat suitability  
25 during fall is derived from published literature and unpublished  
26 information linking X2 to the amount of suitable abiotic habitat  
27 for delta smelt (Feyrer et al. 2007, 2008)." BiOp at 234. The  
28 BiOp expressly recognizes that the modeling does not precisely  
represent historic X2, as do the peer-reviewed studies on which  
the BiOp relies in part for this component. See BiOp at 204; AR  
018278-018306 (Feyrer, et al. (2008)).

The justification for Action 4 relies heavily on the

1 quantitative analyses presented in Figures E-19 and E-25. See  
2 BiOp at 373. Whether Action 4, which has substantial adverse  
3 impacts on the water supply, is justified in the absence of the  
4 quantitative analysis cannot be determined. These questions are  
5 too serious to go unanswered and must be remanded to the agency  
6 for further explanation and/or correction.  
7

8 (3) Other Challenges to the Fall X2 Action.

9 Plaintiffs raise additional challenges to the justification  
10 for the Fall X2 action, arguing "neither the BiOp nor the record  
11 demonstrate that Component 3 (Action 4) is necessary to avoid  
12 jeopardy to the delta smelt or destruction or adverse  
13 modification of its critical habitat, or that it will materially  
14 benefit the species or its habitat." Doc. 697 at 25.  
15

16  
17 a. Plaintiffs' Argument that Action 4 is an "Untested  
Hypothesis."

18 Plaintiffs maintain that Action 4 is nothing more than an  
19 "untested hypothesis," emphasizing that FWS acknowledges the need  
20 to assess the efficacy of Action 4 over time:  
21

22 The Service shall conduct a comprehensive review of the  
23 outcomes of the Action and the effectiveness of the  
24 adaptive management program ten years from the signing  
25 of the biological opinion, or sooner if circumstances  
26 warrant. This review shall entail an independent peer  
27 review of the Action. The purposes of the review shall  
28 be to evaluate the overall benefits of the Action and  
to evaluate the effectiveness of the adaptive  
management program. At the end of 10 years or sooner,  
this action, based on the peer review and Service  
determination as to its efficacy shall either be  
continued, modified or terminated.



1 BiOp at 283.

2  
3 This does not render Action 3 a mere "hypothesis," nor does  
4 this "demonstrat[e] the absence of a rational connection between  
5 Action 4 and an increase in smelt abundance." Doc. 697 at 25.  
6 It is not inconsistent to find an action necessary, while also  
7 calling for an evaluation whether that action actually produced  
8 the expected outcomes. It is of no moment that in a research  
9 paper Mr. Feyrer referred to the X2 requirement as "the  
10 hypothesis that the combined effects of pre-adult abundance and  
11 the amount of suitable abiotic habitat (or X2) during autumn  
12 affect recruit abundance the following summer." AR 018285  
13 (Feyrer unpub. 2008). He is a scientist gathering further  
14 information about the relationship between X2 and smelt  
15 population dynamics. The record does not suggest this is  
16 scientifically improper. It was not clearly erroneous for FWS to  
17 rely upon Feyrer's 2008 research paper.  
18  
19

20 b. FWS' Reliance on the Feyrer Papers.

21 FWS based its effects analysis of X2 in part<sup>31</sup> on two  
22

---

23  
24 <sup>31</sup> Plaintiffs argue that "FWS based its effects analysis of X2 entirely  
25 on two articles written by Feyrer, et al." Doc. 551 at 34 (emphasis added).  
26 Federal Defendants point to pages 152 to 179 of the BiOp to demonstrate that  
27 FWS considered a broad range of other materials in analyzing X2. However,  
28 these pages are not part of the BiOp's Effects Analysis nor the description  
and justification for Action 4. Rather, they describe FWS's view of the delta  
smelt's status and description of the environmental baseline. The portion of  
the BiOp that actually examines the purported relationship between X2 and  
smelt habitat states that FWS's "evaluation of habitat suitability considered  
three specific elements: X2, total areas of suitable abiotic habitat, and the  
predicted effect on delta smelt abundance the following summer." BiOp at 234-

1 articles written by Feyrer et al., which purported to show a  
2 correlation between X2 in the autumn and subsequent delta smelt  
3 abundance. See BiOp at 235-38 (citing Feyrer et al. (2007);  
4 Feyrer et al. (2008)). Plaintiffs argue that these articles did  
5 not represent the best available science because "the correlation  
6 they claimed to find was driven by the presence of a single  
7 unrepresentative data point." Doc. 551 at 34. Even assuming the  
8 scientific validity of the 2007 and 2008 Feyrer analysis,  
9 Plaintiffs contend the BiOp's X2 conclusions far exceed what the  
10 articles scientifically support. *Id.*

11  
12 Plaintiffs' letter, responding to a draft of the BiOp,  
13 identified a purported flaw in the Feyrer et al. (2008) analysis:  
14 the supposed correlation between Fall X2 and delta smelt  
15 abundance Feyrer et al. was driven by the presence of a single,  
16 apparently outlier, data point. Removing that data point  
17 resulted in a finding of no statistically significant  
18

19  
20 35. The description of the first of these three elements refers to the  
21 "CALSIM II modeled results" and "Feyrer 2007, 2008." BiOp at 235. Similarly,  
22 the second step of the evaluation, modeling the location of X2 purportedly to  
23 determine the "total surface area of suitable abiotic habitat," also relied on  
24 "modeled X2" and the Feyrer 2008 paper. BiOp at 235. Finally, in the third  
25 step of the evaluation, FWS allegedly used the modeled X2 data to estimate the  
26 effect of Project operations on delta smelt abundance. BiOp at 236. This  
27 third step cited extensively to the Feyrer (2007) article and a Feyrer 2008  
28 paper, along with a citation to Bennett (2005). Facially, the X2 analysis  
relied on the modeled X2 data, Feyrer's work, and Bennett's 2005 paper.

Plaintiffs suggest that the modeled X2 data did not constitute a  
separate justification for Action 4 because the reason FWS gave in the BiOp  
for presenting the Calsim II model results in a monthly time step was "to be  
consistent with previous analyses (Feyrer 2007, 2008)." BiOp at 235. But,  
this does not mean that the Calsim II data was somehow dependent upon Feyrer's  
work. Rather, that data was presented in such a way to be consistent with the  
way Feyrer analyzed data. In the final analysis, Action 4 did rely  
extensively, but not exclusively, on Feyrer's articles.

1 relationship between Fall X2 and the abundance of delta smelt.  
2 See SLDMWA & SWC Letter to NMFS and FWS (Oct. 20, 2008) at 2 (AR  
3 006407). As the letter noted, "a correlation solely reliant upon  
4 a single data point cannot reasonably be considered as an actual  
5 indicator of cause." *Id.* Plaintiffs' argument continues:

6  
7 That there was no statistically significant  
8 relationship between X2 and delta smelt abundance  
9 during the 1987-2007 period should not have been  
10 surprising given that Feyrer et al. found no  
11 statistically significant relationship between the two  
12 factors for the 1968-1986 period or for the entire  
13 1968-2007 period. Feyrer et al. (2008) at 14 (AR  
14 018291). Nor was it surprising considering that—as the  
15 Feyrer et al. (2008) article conceded—the existing best  
16 available science on delta smelt showed no direct  
17 correlation between the location of Fall X2 and delta  
18 smelt abundance. Feyrer et al. (2008) at 8  
19 ("[P]revious analyses have not shown simple  
20 relationships between X2 and delta smelt abundance.")  
21 (AR 018285).

22 Doc. 551 at 35.

23 Federal Defendants respond:

24 [U]nless data points are excluded to control for a  
25 specific variable, or for some other explicit reason  
26 that is central to measuring the relationship at issue,  
27 there is no scientific reason to remove a data point  
28 from an analysis just because it changes the result.  
In any event, removing the data point challenged by  
Plaintiffs does not appreciably change the result - the  
result goes from a 95% probability the relationship is  
not due to chance to a 92% probability that the  
relationship is not due to chance. Moreover, this is  
an argument that can go both ways. Removing other  
individual data points would increase the statistical  
significance.

29 Doc. 660 at 44. Federal Defendants are correct that removing a  
30 data point simply because it changes the result would be  
31 arbitrary. Plaintiffs do not point to any scientific basis, let

1 alone an undisputed one, for excluding the so-called "outlier"  
2 point, other than that it is an outlier. Plaintiffs do not show  
3 the point is erroneous or identify competing studies that reach  
4 different opinions from Feyrer that FWS failed to consider. This  
5 is a scientific dispute among experts over which the agency is  
6 owed deference.  
7

8 c. Do the Studies Cited in the BiOp Support FWS's  
9 Conclusion that Fall X2 Determines the Extent of  
10 Suitable Smelt Habitat?

11 The BiOp concludes that to avoid jeopardy the RPA Actions  
12 must "[i]mprove fall habitat for delta smelt by managing [] X2  
13 through increasing Delta outflow during fall when the preceding  
14 water year was wetter than normal." BiOp at 369; see also BiOp  
15 at 374 ("Outflow during fall determines the location of X2, which  
16 determines the amount of suitable abiotic habitat available to  
17 delta smelt (Feyrer et al. 2007, 2008)."). Plaintiffs argue that  
18 none of the articles FWS cited in the BiOp actually support FWS's  
19 conclusion that the location of X2 determines the amount of  
20 suitable habitat for the delta smelt. See Doc. 551 at 39-41.  
21

22 (1) Feyrer (2007).

23 Plaintiffs first criticize the BiOp's reliance on a 2007  
24 Canadian Journal of Fisheries and Aquatic Sciences paper by  
25 Feyrer, Nobriga, and Sommer, three scientists then working for  
26 Plaintiff DWR, entitled, "Multidecadal trends for three declining  
27 fish species: habitat patterns and mechanisms in the San  
28

1 Francisco Estuary, California, USA." AR 018266-77. That paper  
2 used a generalized additive model to assess the relationship  
3 between changes in environmental quality for delta smelt  
4 (particularly salinity and turbidity) and the abundance of delta  
5 smelt. *Id.*

6  
7 The paper demonstrated that a statistically significant  
8 relationship existed between salinity and turbidity in the fall  
9 months and the abundance of juvenile delta smelt the following  
10 summer for the period of 1987-2004. *Id.* This time period was  
11 chosen because it corresponded to the invasion of the *Corbula*  
12 *amurensis* clam which has resulted in significant ecological  
13 changes to the Delta. AR 018270. The results demonstrated that  
14 63 percent of sampling stations showed statistically significant  
15 declines in environmental quality in the fall, with the western  
16 and southeastern regions of the Delta suffering the most  
17 substantial long term declines in habitat quality, while the area  
18 at the confluence of the Sacramento and San Joaquin Rivers least  
19 affected by the changes in fall habitat quality. *Id.*

20  
21 The Feyrer (2007) analysis uses the results of a 2005 study  
22 by William Bennett published in the Journal of San Francisco  
23 Estuary and Watershed Science, which concluded: "Factors defining  
24 the carrying capacity for juvenile delta smelt are unknown, but  
25 may include a shrinking volume of physically suitable habitat  
26 combined with a high density of competing planktivorous fishes  
27  
28

1 during late summer and fall." AR 017004.

2 The BA acknowledged the results of this 2007 study,  
3 including the conclusion that fall habitat conditions have  
4 population level effects:

5 Based on a 36-year record of concurrent midwater trawl  
6 and water quality sampling, there has been a long-term  
7 decline in fall habitat environmental quality for delta  
8 smelt (Feyrer et al. 2007). The long-term  
9 environmental quality declines for delta smelt are  
10 defined by a lowered probability of occurrence in  
11 samples based on changes in specific conductance and  
12 Secchi depth. Notably, delta smelt environmental  
13 quality declined recently coinciding with the POD  
14 (Figure 7-8). The greatest changes in environmental  
15 quality occurred in Suisun Bay and the San Joaquin  
16 River upstream of Three Mile Slough and southern Delta  
17 (Figure 7-9). There is evidence that these habitat  
18 changes have had population-level consequences for  
19 delta smelt. The inclusion of specific conductance and  
20 Secchi depth in the delta smelt stock-recruit  
21 relationship described above improved the fit of the  
22 model, suggesting adult numbers and their habitat  
23 conditions exert important influences on recruitment.

24 AR 010626; see also AR 10628-29 (reproducing maps and graphics  
25 showing habitat declines and geographic distribution of declines  
26 from Feyrer (2007)).

27 The conclusions in Feyrer (2007) were also recognized in the  
28 January 2008 report on the Pelagic Organism Decline by the  
29 Interagency Ecological Program, which reached nearly identical  
30 conclusions about the effects of declining fall habitat quality  
31 on delta smelt abundance. See AR 016938, 016954, 016957.

32 Plaintiffs level several criticisms at Feyrer (2007) and the  
33 BiOp's use of the study. First, Plaintiffs complain that the  
34 Feyrer study "repeatedly states that the article supports only  
35 the 'hypothesis' that EQ (a metric devised by Feyrer that

1 incorporates two factors - secchi depth and temperature - in  
2 addition to salinity) is 'an important predictor of delta smelt  
3 abundance during the 1987-2004 post-*Corbula* period.'" Doc. 697  
4 at 29 (citing AR 018271). The use of the term "hypothesis" does  
5 not undermine Feyrer's conclusions, as articulating a hypothesis  
6 is a step in the scientific method.  
7

8 Plaintiffs next point out that while Feyrer (2007) found a  
9 statistically significant relationship between the location of X2  
10 and delta smelt abundance from 1987-2004, there was no  
11 statistically significant correlation for the twenty years prior  
12 to *Corbula's* arrival (1968-1986). AR 018271. The article  
13 acknowledged "[b]iotic variables, most notably competition,  
14 predation, and food availability, could have also played a major  
15 role in controlling the distribution" of delta smelt and "[t]he  
16 recent step change in the abundance of pelagic fish suggests that  
17 salinity alone may not be sufficient to explain long-term trends  
18 in estuarine management." AR 018275. The article confirms that  
19 even when considering specific conductance (i.e., X2), secchi  
20 depth, and temperature together, those three factors collectively  
21 only predict 25.7% of future delta smelt occurrence. AR 018271.  
22 Finally, the article concludes that "the degree to which EQ could  
23 be used for management purposes remains unclear." AR 018275.  
24

25  
26 *Tucson Herpetological Society*, 566 F.3d 870, held that an  
27 agency may not rely on "underdeveloped and unclear" studies to  
28

1 support ESA findings. There, an earlier FWS finding concluded  
2 that population dynamics information for the flat-tailed horned  
3 lizard was "limited and inconclusive." *Id.* at 878.  
4 Nevertheless, FWS relied on these uncertain studies to infer that  
5 the lizard population remained viable throughout most of its  
6 range. *Id.* The Ninth Circuit found that FWS's "affirmative[]  
7 reli[ance] on ambiguous studies as evidence of persistence..." to  
8 be unreasonable because "the studies do not lead to the  
9 conclusion that the lizard persists in a substantial portion of  
10 its range and therefore cannot support the Secretary's  
11 conclusion." *Id.* at 879.

12  
13 FWS's reliance on Feyrer (2007) is distinguishable.  
14 Although Feyrer (2007) acknowledges that multiple factors may be  
15 contributing to the delta smelt's decline, the study  
16 affirmatively finds a statistically significant, albeit limited,  
17 correlation between the fall location of X2 and subsequent delta  
18 smelt abundance. This finding is not uncertain. It acknowledges  
19 the context of a complex ecosystem in which many factors may  
20 impact the species. Feyrer's X2 analysis explains only 25.7  
21 percent of subsequent year abundance. This is not a *de minimis*  
22 impact. (It goes, rather, to the agency's overemphasis on X2 to  
23 impose a significantly restrictive fall RPA component.)  
24 Plaintiffs cite no studies that demonstrate the cause of the  
25 remaining 74.3 percent variation in abundance. FWS's reliance on  
26  
27  
28



1 Feyrer (2007) was not *per se* unreasonable, however, FWS's use of  
2 the study to justify operational restrictions is more  
3 questionable.  
4

5 (2) The Feyrer (2008) Paper.

6 A 2008 paper by the same authors (Feyrer, Nobriga, Sommer),  
7 along with Ken Newman of FWS, appeared in the *Estuaries and*  
8 *Coasts* journal. See AR 018278-306. This expanded upon the 2007  
9 research, used statistical analyses, including both Ricker and  
10 Beverton-Holt type models, to compare Fall X2, habitat area for  
11 and subsequent abundance of delta smelt. *Id.* Like Feyrer  
12 (2007), it concluded that fall habitat quality had a  
13 statistically significant effect on subsequent delta smelt  
14 abundance, determining that the model incorporating prior  
15 abundance and X2 accounted for 66 percent of the variability in  
16 subsequent abundance. *Id.* The authors identified a number of  
17 reasons why the location and extent of fall habitat affected  
18 subsequent abundance:  
19  
20

21 First, positioning X2 seaward during autumn provides a  
22 larger habitat area which presumably lessens the  
23 likelihood of density-dependent effects (e.g., food  
24 availability) on the delta smelt population. For  
25 example, food availability during autumn for adult  
26 haddock (*Melanogrammus aeglefinus*) likely improves  
27 juvenile recruitment the following year (Friedland et  
28 al. 2008). Second, a more confined distribution may  
increase the probability of stochastic events that  
increase mortality rates of adults. For delta smelt,  
this includes both predation, as well as anthropogenic  
effects such as contaminants or water diversion loss  
(Sommer et al. 2007).

AR 018293. The study concluded: "Comparing the first ten years

1 of the time series to the last ten years, the amount of suitable  
2 abiotic habitat for delta smelt during autumn has decreased  
3 anywhere from 28% to 78%, based upon the least and most  
4 restrictive habitat definitions, respectively." AR 018293-94.

5 Like Feyrer (2007), Feyrer (2008) narrowly considered  
6 abiotic factors alone, and limited its focus on X2. Feyrer  
7 (2008) concludes that manipulating X2 might affect delta smelt  
8 populations, but that "the specific mechanisms by which X2  
9 affects delta smelt remain poorly understood." AR 018294.  
10 Because of this uncertainty, Feyrer (2008) recommended that any  
11 "'real world' applications of [its] results should incorporate an  
12 adaptive management approach, allowing resource manager[s] to  
13 adjust actions in response to new data collected on delta smelt  
14 habitat conditions and use." *Id.*

15 Other than arguing that Feyrer (2008), like Feyrer (2007),  
16 used the "outlier" data point, Plaintiffs submitted no other  
17 substantive criticism of Feyrer (2008). FWS made no error in  
18 considering Feyrer (2008).  
19  
20  
21

22 (3) The Bennett (2005) Article.

23 Plaintiffs criticize the BiOp's citation of Bennett (2005),  
24 because, like the Feyrer studies, this article does not conclude  
25 that salinity or the location of X2 is a determinative factor in  
26 delta smelt abundance. Bennett (2005) specifically addresses:  
27 "[w]hat is the impact of human activities, particularly water  
28

1 export operations, on population abundance?" AR 017061. Bennett  
2 (2005) surveyed available data and concluded: "[t]his synthesis  
3 of the available information cannot answer th[is] vital  
4 management question." AR 017062. "The lack of appropriate data  
5 ... impedes efforts to resolve th[is] issue ...." AR 017004.

6  
7 The BiOp does not rely on Bennett (2005) as the "be all end  
8 all" to address the management question. The BiOp cites Bennett  
9 (2005) for a series of factual assertions, including the premise  
10 that: "There is a statistically significant stock-recruit  
11 relationship for delta smelt in which pre-adult abundance  
12 measured by the FMWT positively affects the abundance of  
13 juveniles the following year in the TNS." BiOp at 178.

14 Plaintiffs do not disagree that Bennett supports this assertion.  
15 See AR 017035 (reviewing various studies finding a relationship  
16 between X2 position and smelt abundance). Plaintiffs have not  
17 demonstrated that the BiOp misrepresented Feyrer (2007), Feyrer  
18 (2008), or Bennett (2005), or that any of these studies are not  
19 part of the best available science.  
20

21  
22 d. Does the Best Available Science Support the  
23 Assumption that X2 Is a Surrogate for Smelt  
Habitat?

24 Plaintiffs object that FWS' use of X2 as a "surrogate"  
25 indicator for delta smelt habitat suitability is not supported by  
26 the best available science, arguing: "FWS stretched the limited  
27 findings of Feyrer et al. (2007 & 2008) far beyond defensible  
28

1 application, converting a tentative finding that the location of  
2 X2 might influence habitat suitability into a definite conclusion  
3 that X2 alone determines the area and extent of delta smelt  
4 habitat for delta smelt." Doc. 551 at 38.

5 Feyrer (2007) discussed its limitations: "[T]he degree to  
6 which EQ [Feyrer's three-part index of environmental quality,  
7 which included salinity] could be used for management purposes is  
8 unclear.... salinity alone may not be sufficient to explain long-  
9 term trends in estuarine management." AR 018275. Feyrer (2008)  
10 concluded, "[o]ur results suggest that managing estuarine flow or  
11 X2 during autumn can have positive effects on delta smelt habitat  
12 and abundance." AR 018292. The FWS BiOp relied on these two  
13 studies to conclude: "Outflow during fall determines the  
14 location of X2, which determines the amount of suitable abiotic  
15 habitat available to delta smelt (Feyrer et al. 2007, 2008)."  
16 BiOp at 374. This is one scientific interpretation of X2's role.  
17 It may be a "stretch" or unjustified expansion of Feyrer (2007)  
18 or Feyrer (2008), however, when all the disputed X2 studies are  
19 considered, X2 has a measurable effect on smelt abiotic habitat.<sup>32</sup>  
20  
21  
22

---

23  
24 <sup>32</sup> The BiOp asserts that Component 3 will improve smelt habitat "quality  
25 and quantity" in the fall. BiOp at 282. Plaintiffs point out that FWS has  
26 explicitly recognized that delta smelt habitat must be defined to encompass,  
27 in addition to space and salinity, food, water, air, light, minerals, or other  
28 nutritional or physiological requirements; cover or shelter; sites for  
breeding; habitats that are protected from disturbance or are representative  
of the historic geographical and ecological distributions of a species,  
including physical habitat, water, and river flow. 59 Fed. Reg. 65,256,  
65,259 (Dec. 19, 2004). Plaintiffs complain that "X2 is a metric that  
describes only a two-dimensional space consisting of a particular salinity at

1 a. Are Delta Smelt Habitat Limited?

2 Plaintiffs assert that FWS ignored available evidence SLDMWA  
3 and SWC presented to FWS indicating that delta smelt are  
4 particularly unlikely to be habitat-limited, given their record  
5 low abundance. SLDMWA-SWC Letter at 5-6, AR 006410-006411.

6 It is unquestioned that delta smelt survey results show  
7 decreasing abundance throughout the 2000s, with their current  
8 abundance at a historic low. BiOp at 154. In addition, the BiOp  
9 notes that "most life stages of the delta smelt are now  
10 distributed across a smaller area than historically," and  
11 recognizes that this is likely due to multiple factors, including  
12 channelization, conversion of Delta islands to agriculture, water  
13 project operations, salinity, turbidity, high summer water  
14 temperatures, and predacious species. BiOp at 152-53, 157.  
15 Plaintiffs argue that "simply because the delta smelt may  
16 currently occupy lesser spatial area than they did previously,  
17 does not mean that forcing a relocation or expansion of X2 will  
18 impact the species beneficially or at all." Doc. 697 at 33.

19 Most of Plaintiffs' evidence submitted to support this argument  
20  
21  
22

---

23 a specific depth in the Delta's channels; it is not coterminous with the  
24 dynamic three-dimensional space that supports the abiotic and biotic  
25 components that define delta smelt habitat." Doc. 697 at 35. In support of  
26 this assertion, Plaintiffs refer to many statements in the studies cited in  
27 the BiOp, indicating that X2 does not explain all variability in delta smelt  
28 abundance and/or distribution. *Id.* Those very same studies and the BiOp  
acknowledge that, while X2 does not explain everything, it explains enough to  
consider X2 a proxy for critical habitat and to structure management  
prescriptions around X2. That X2 is an imperfect proxy is relevant to the  
degree of uncertainty and justification FWS provides for the specific RPA  
prescriptions imposed.

1 has been stricken. See Doc. 750 at ¶ 8 (striking paragraphs 14-  
2 17 of the Declaration of Charles H. Hanson, Doc. 395).

3 Plaintiffs insist that the BiOp itself admits that the delta  
4 smelt is not currently habitat-limited, citing pages 237 and 374.

5 Page 237 makes such an admission, but it is qualified:  
6

7 Combined, these effects of project operations on X2  
8 will have significant adverse direct and indirect  
9 effects on delta smelt. Directly, these changes will  
10 substantially decrease the amount of suitable abiotic  
11 habitat for delta smelt, which in turn has the  
12 possibility of affecting delta smelt abundance through  
13 the compensatory density-dependant mechanisms outlined  
14 above. Because current abundance estimates are at such  
15 historic low levels, compensatory density-dependence can  
16 be a serious threat to delta smelt despite the fact  
17 that the population may not be perceived to be habitat  
18 limited. It is clear from published research that delta  
19 smelt has become increasingly habitat limited over time  
20 and that this has contributed to the population  
21 declining to record-low abundance levels (Bennett 2005;  
22 Baxter et al. 2008; Feyrer et al. 2007, 2008; Nobriga  
23 et al. 2008). Therefore, the continued loss and  
24 constriction of habitat proposed under future project  
25 operations significantly threatens the ability of a  
26 self-sustaining delta smelt population to recover and  
27 persist in the Estuary at abundance levels higher than  
28 the current record-lows.

(Emphasis added). Pages 374-75 state:

21 The persistence of this significant hydrologic change  
22 to the estuary threatens the recovery and persistence  
23 of delta smelt. Outflow during fall determines the  
24 location of X2, which determines the amount of suitable  
25 abiotic habitat available to delta smelt (Feyrer et al.  
26 2007, 2008). The long-term upstream shift in X2 during  
27 fall has caused a long-term decrease in habitat area  
28 availability for delta smelt (Feyrer et al. 2007,  
2008), and the condition will persist and possibly  
worsen in the future. This alone is a significant  
adverse effect on delta smelt.

However, the problem is further complicated because

1           there are several lines of published peer reviewed  
2           scientific research that link habitat alteration to the  
3           decline of delta smelt (Bennett 2005; Feyrer et al.  
4           2007; Nobriga et al. 2008). An important point  
5           regarding this action is that because of the current,  
6           extremely low abundance of delta smelt, it is unlikely  
7           that habitat space is currently a limiting factor.  
8           However, it is clear that delta smelt have become  
9           increasingly habitat limited over time and that this  
10           has contributed to the population attaining record-low  
11           abundance levels (Bennett 2005; Baxter et al. 2008;  
12           Feyrer et al. 2007, 2008; Nobriga et al. 2008).  
13           Further, as detailed in the Effects section, persistent  
14           degraded or worsened habitat conditions are likely to  
15           contribute to depensatory density-dependent effects on  
16           the delta smelt population while it is at historical  
17           low levels, and would at some point in the proposed  
18           term of this project, limit delta smelt recovery.

19           While "admitting" that the delta smelt may not be habitat-  
20           limited, the smelt has become "increasingly habitat-limited over  
21           time," contributing to the population's decline, and that  
22           worsening habitat conditions may limit smelt recovery.

23           Plaintiffs have not presented any record best available  
24           scientific evidence not considered by FWS that contradicts this  
25           conclusion.

26           b.     FWS' Use of a Linear Model Instead of a  
27                 Multiplicative Stock-Recruit Model .

28           Plaintiffs next argue that FWS committed a serious  
29           scientific error by employing a linear additive model to  
30           determine the effect of Fall X2 on delta smelt abundance. See  
31           BiOp at 268, Figure E-22. Dr. Deriso opines that FWS' use of the  
32           linear additive model ran counter to decades of established  
33           scientific consensus that linear models are not effective for

1 modeling fish populations. Deriso Decl., Doc. 396, at ¶ 80. He  
2 claims that standard practice in fisheries management is to use a  
3 multiplicative stock-recruit model, such as the Beverton-Holt or  
4 Ricker models, both of which are among the standard tools of the  
5 relevant science. *Id.* at ¶ 83; see also Hilborn, Decl., Doc.  
6 393, at ¶ 31.

7  
8 The BiOp estimated the effect of X2 on delta smelt abundance  
9 by using an updated version of the linear-additive model  
10 developed in Feyrer (2008). BiOp at 236. The result was Fig. E-  
11 22, which shows a linear relationship between X2 and delta smelt  
12 abundance such that juvenile abundance (which is measured using  
13 the Spring Tow-Net Survey) is equal to the sum of a constant  
14 number, plus the previous year's Fall Midwater Trawl Survey  
15 (times a constant number), minus X2 (times a constant number).  
16 BiOp at 268. Put simply, FWS' calculation found that  $A = B + C$   
17 - D. Deriso Decl., Doc. 396, at ¶ 78.

18  
19 Dr. Deriso explains the two fundamental problems with using  
20 an additive model. First, a linear additive model can produce  
21 the biologically implausible result that the total absence of  
22 adults in one year (i.e., no mature smelt to mate and lay eggs)  
23 could still result in the model indicating the presence of  
24 newborn smelt the next year. *Id.* at ¶ 80. As Dr. Deriso  
25 explains, this nonsensical result is the product of basic  
26 mathematical structure: if A (number of juveniles) = B  
27  
28



1 (constant) + C (adults) - D (Fall X2), then A can be positive  
2 even if C is zero, as long as B is larger than D. See *id.*

3 The second fundamental problem with a linear additive model  
4 is that it treats X2 as a purely "additive factor," meaning that  
5 an increase of X2 by one unit will always reduce the delta smelt  
6 population by a certain number, no matter how large or small the  
7 total population may be. *Id.* at ¶ 81. Dr. Deriso's critique  
8 implies that if changes in X2 are harmful to delta smelt, it is  
9 logical to expect that a change in X2 would affect a considerably  
10 higher absolute number of delta smelt in a population of  
11 1,000,000 than in a population of 1,000. See *id.*

12 Use of a multiplicative stock-recruit model solves both of  
13 these deficiencies. *Id.* at ¶¶ 84-85. Multiplicative models are  
14 the textbook standard for modeling fish and other populations.  
15 See Deriso Decl., Doc. 396, at ¶ 43 n.3 (citing a representative  
16 sample of studies making use of multiplicative stock-recruit  
17 models); see also, e.g., Bennett (2005) at 28-29 (using a  
18 multiplicative stock-recruit model for smelt abundance), AR  
19 017031-017032; see also Hilborn Decl., Doc. 393, at ¶¶ 30-31.  
20 Multiplicative stock-recruit models are preferred because they  
21 can better reflect the biological realities and idiosyncrasies of  
22 the fish species of concern. See Deriso Decl., Doc. 396, at ¶  
23 83. This is because survival processes are inherently  
24 multiplicative: the fraction of individuals that survive to a  
25  
26  
27  
28

1 given age will naturally be the product of all of the previous  
2 daily survival rates since birth. *Id.* Dr. Hilborn opined that  
3 the linear additive "approach is totally inconsistent with  
4 accepted practice in population dynamics." Hilborn Decl., Doc.  
5 393, at ¶ 30.

6  
7 Plaintiffs point to several record documents critical of  
8 FWS's modeling approach. For example, several Plaintiffs sent  
9 comment letters recommending the use of a logarithmic model. See  
10 AR 006406. In addition, the Peer Review Panel expressed general  
11 concerns with the linear model, stating "the model may be  
12 inappropriate for the data being used." AR 008819.

13  
14 FWS noted in the BiOp that although the regression model  
15 works for 56 percent of the data points, the residuals are "not  
16 normally distributed." BiOp at 236. FWS continued, "[t]he  
17 pattern of the residuals suggests that some type of  
18 transformation of the data would help to define a better fitting  
19 model (Figure E-22). This analysis did not explore different  
20 data transformations." *Id.* Plaintiffs maintain that "exploring"  
21 different data transformations would not require FWS to conduct  
22 independent studies or to develop any new types of mathematical  
23 models, but rather would only require plugging existing data into  
24 the standard model used by fisheries biologists throughout the  
25 world. See Deriso Decl. ¶ 89.

26  
27 Federal Defendants respond that this critique is much ado  
28

1 about nothing because, even though linear additive models can  
2 produce "biologically infeasible results" in some situations, the  
3 data set employed in the BiOp could not have created such a  
4 problem. See Newman Decl., Doc. 484, at ¶ 19 (explaining that  
5 "for the given range of FMWT index and X2 values, the model-  
6 fitted values remained positive" using the linear model). Dr.  
7 Newman opined that "linear models are often used as  
8 approximations to more realistic nonlinear models, and often over  
9 the range of covariate values of interest the nonlinear model may  
10 in fact be relatively linear." *Id.*

12 A court "may reject an agency's choice of a scientific model  
13 'only when the model bears no rational relationship to the  
14 characteristics of the data to which it is applied.'" *NWF v. EPA*,  
15 286 F.3d at 565; see *Nat'l Ass'n of Metal Finishers v. EPA*, 719  
16 F.2d 624, 657 (3rd Cir. 1983) ("the choice of scientific data and  
17 statistical methodology to be used is best left to the sound  
18 discretion of the [agency]") *rev'd* on other grounds *sub nom.*,  
19 *Chem. Mfrs. Ass'n v. NRDC*, 470 U.S. 116 (1985).

21 Here, Plaintiffs critique raises a scientific dispute among  
22 experts. Dr. Newman's declaration provides evidence that the  
23 linear model used in the BiOp is not totally inappropriate. See  
24 Newman Decl., Doc. 484, at ¶ 19. It requires refinement, which  
25 FWS said it did. Newman's declaration also points out that the  
26 re-analysis by Dr. Deriso, using Deriso's model of choice, yields  
27  
28

1 a result that also exceeds the 0.05 threshold of statistical  
2 significance. *Id.*

3 Feyrer's 2007 analysis was published in a peer-reviewed  
4 scientific journal. Although the BiOp's Effect's Analysis Peer  
5 Review questioned the model, the reviewers did not recommend that  
6 the analysis or action be excluded; instead, that panel broadly  
7 supported implementation of the Fall X2 action, based in part on  
8 the analysis using the linear model, provided that the BiOp  
9 impose requirements for continued refinement of the analysis and  
10 implementation of the action by adaptive management. It is a  
11 close call. Absent agency bad faith, Plaintiffs have not  
12 established that this modeling dispute proves FWS violated the  
13 best available science standard.  
14  
15

16 c. DWR's Challenge to the BiOp's Choice of X2  
17 Location.

18 RPA Component 3 (Action 4) requires the Projects to be  
19 operated to maintain X2 during the fall months at a location no  
20 greater than 74 km upstream from the Golden Gate Bridge following  
21 wet water years, and no greater than 81 km upstream following  
22 above normal water years. BiOp at 282-283. The rationale for  
23 this Component rests in large part on the Calsim II Dayflow  
24 comparison articulated in the Effects Analysis and discussed  
25 above. See BiOp 373-375, (explaining that the Effects section  
26 "clearly indicates there will be significant adverse impacts on  
27 X2"). As already determined, in the absence of calibration of  
28

1 the two models, the Calsim II to Dayflow comparison has the  
2 potential to introduce significant, if not overwhelming, bias to  
3 the analysis that the BiOp nowhere discussed or corrected. The  
4 X2 action must be remanded to the agency for further  
5 consideration.

6  
7 DWR also argues the X2 action is unlawful for a different  
8 reason, arguing that "[a]lthough the BiOp explains why Action 4  
9 is to be implemented only in certain water year types, see BiOp  
10 373-75, it fails completely to explain or justify the requirement  
11 that X2 be held at the locations specified." Doc. 548 at 9.  
12 Federal Defendants have not identified any record evidence that  
13 provides such an explanation. This total lack of explanation  
14 violates the APA's requirement that FWS "examine the relevant  
15 data and articulate a satisfactory explanation for its action  
16 including a rational connection between the facts found and the  
17 choice made." *Motor Vehicle Mfrs. Ass'n v. State Farm Mutual*  
18 *Auto. Ins. Co.*, 463 U.S. 29, 43 (1983). This failure also  
19 violates FWS's own Consultation Handbook implementing the ESA,  
20 which requires: "When a reasonable and prudent alternative  
21 consists of multiple activities, it is imperative that the  
22 opinion contain a thorough explanation of how each component of  
23 the alternative is essential to avoid jeopardy and/or adverse  
24 modification." ESA Handbook at 4-43. The BiOp violates this  
25 requirement because it fails to explain why it is essential to  
26  
27  
28

1 maintain X2 at 74 km and 81 km, respectively, as opposed to any  
2 other specific location.

3  
4 (4) Challenges to Turbidity Trigger.

5 In their opening brief, Plaintiffs argue that one of the  
6 underlying tenants of Component 1 -- the link between turbidity  
7 and smelt presence -- has been "revealed as wholly arbitrary and  
8 capricious." Doc. 551 at 29. Action 1 of RPA Component 1 is  
9 triggered when "first flush conditions" occur, which are  
10 demonstrated by elevated river inflow and turbidity. BiOp at  
11 280-81. The BiOp claims turbidity is an appropriate "on-ramp"  
12 indicator for Action 1, because delta smelt presence and  
13 densities are correlated with turbid water, i.e., more delta  
14 smelt are found in turbid water than in clearer water, and so as  
15 turbid waters move towards CVP/SWP pumps, delta smelt must as  
16 well, which warrants severe pumping restrictions. See BiOp at  
17 150-51, 280-81, 329-30.

18  
19 Plaintiffs argue that after issuing the disputed BiOp and  
20 the RPA, FWS "recanted its confidence in the usefulness of  
21 turbidity as such an indicator" in a December 2009 "Interim  
22 Federal Action Plan for the California Bay-Delta" ("Federal  
23 Action Plan") to which FWS was a signatory. Doc. 551 at 29.  
24 That Federal Action Plan, which was attached to the Declaration  
25  
26  
27  
28

1 of Ronald Milligan<sup>33</sup> in Support of Federal Defendants' Opposition  
2 to Plaintiffs' Motion for Interim Remedy/Preliminary Injunction  
3 ("Milligan Decl."), Doc. 471, ¶ 11 & Exh. 3 at 10, contains the  
4 following discussion of a "2-Gates Fish Protection Demonstration  
5 Project":  
6

7 [The P]roject was proposed as a scientific experiment  
8 to test the hypotheses that delta smelt follow  
9 turbidity and that smelt entrainment at the pumps could  
10 be prevented by keeping turbid water away from the  
11 pumps.... Once in place, the gates would be operated  
12 to reduce turbidity near the State and Federal pumps,  
13 and an evaluation could then be made of whether  
14 turbidity is, in fact, an accurate predictor of the  
15 presence of smelt.

16 *Id.* (emphasis added). Plaintiffs complain that "FWS cannot  
17 simultaneously view turbidity as only a hypothetical indicator of  
18 delta smelt presence, and also as a scientifically defensible  
19 basis to develop an RPA with significant water costs. The two  
20 positions are fundamentally contradictory, resulting in an  
21 arbitrary RPA." Doc. 551 at 30.

22 Plaintiffs are mistaken. First, the turbidity indicator is  
23 not an automatic trigger for RPA Component 1:

24 In order to prevent or minimize such entrainment,  
25 Action 1 shall be initiated on or after December 20 if  
26 the 3 day average turbidity at Prisoner's Point,  
27 Holland Cut, and Victoria Canal exceeds 12 NTU, or if  
28 there are three days of delta smelt salvage at either  
29 facility or if the cumulative daily salvage count is  
30 above the risk threshold based upon the 'daily salvage  
31 index' approach described in Attachment B.... However,  
32 the SWG can recommend a delayed start or interruption

---

33 Mr. Milligan is the Manager of Reclamation's Central Valley Operations  
Office, with responsibility for the day to day operations of the CVP.  
Milligan Decl., Doc. 471, at ¶ 1.

1                   based on conditions such as delta inflow that may  
2                   affect vulnerability to entrainment.

3                   BiOp at 281 (emphasis added).

4                   FWS's reliance on turbidity as a potential indicator of  
5                   smelt presence or movement was justified. The BiOp explains  
6                   these physical conditions provide foraging, reproductive, and  
7                   other behavioral and biological benefits to delta smelt. Turbid  
8                   waters make it more difficult for delta smelt to be preyed upon,  
9                   BiOp at 150-51, and also make it easier for delta smelt to forage  
10                  for their prey, *id.* (citing 2004 study by Baskerville-Bridges).  
11                  The preference of delta smelt for turbid waters has been verified  
12                  in laboratory conditions with captive delta smelt, BiOp at 150  
13                  (citing a 2008 review by Nobriga and Herbold), and also in the  
14                  field, where studies have observed "a negative correlation  
15                  between the frequency of delta smelt occurrence in survey trawls  
16                  during summer, fall and early winter and water clarity," *id.*  
17                  (citing 2007 study by Feyrer and 2008 study by Nobriga).  
18                  Increased turbidity is a documented indicator of improved habitat  
19                  quality for delta smelt. Plaintiffs have provided any available  
20                  science on the subject that was not considered. It was  
21                  reasonable for the FWS to rely upon turbidity in RPA Component 1  
22                  as a potential predictor of delta smelt movement and adult delta  
23                  smelt distribution.  
24                  smelt distribution.

25                  The Federal Action Plan does not undermine this conclusion.  
26                  As a threshold matter, the Plan is an extra-record document.  
27  
28



1 Even if it were part of the record, it does nothing to call the  
2 FWS's reliance on turbidity into question. The quote from the  
3 Plan relied upon by Plaintiffs describes the "2 Gates Fish  
4 Protection Demonstration Project," a forthcoming project designed  
5 to examine whether turbidity can be physically manipulated  
6 through barge-mounted gate structures, in an effort to keep delta  
7 smelt away from the influence of the pumps so that export pumping  
8 can be increased for the benefit of Plaintiffs and other  
9 agricultural concerns. Federal Action Plan at 10. The Action  
10 Plan will result in FWS and Reclamation continuing to study  
11 turbidity. See Federal Action Plan at 10-11 (announcing the  
12 publicly funded installation of an additional "14 real-time  
13 turbidity sensors in the Delta"). That further study is called  
14 for does not undermine the record evidence supporting the use of  
15 turbidity as an indicator.

16  
17  
18 Plaintiffs do not address the turbidity trigger in their  
19 reply brief. Federal Defendants reliance on turbidity as one of  
20 several triggers for Action 1 was not arbitrary and capricious.

21  
22 (5) Challenges to the Incidental Take Limit/Selective Use  
23 of Data.

24 Plaintiffs maintain Federal Defendants' failed to use the  
25 best available scientific data by selectively excluding data from  
26 certain parts of the BiOp, while including that data in other  
27 sections for different purposes. In particular, Plaintiffs  
28

1 maintain that such selective use of data tainted: (1) the  
2 analysis of the effects of OMR flows on delta smelt; and (2) the  
3 formulation of the incidental take statement.<sup>34</sup>  
4

5 a. FWS's Exclusion of Certain Data Points When  
6 Analyzing Entrainment.

7 On the impact of negative OMR flows on entrainment, the BiOp  
8 relies on a plot of the total number of salvaged adult delta  
9 smelt against OMR flows for the period from 1984 to 2007, BiOp at  
10 164 (Figure S-8), and uses this plot to support the conclusion  
11 that entrainment of adult delta smelt rises with increasingly  
12 negative OMR flows, see BiOp at 164-65, 348-49. It is also  
13 undisputed that FWS eliminated certain data from that plot,  
14 excluding data from the years 1987, 1989, 1990, 1991, 1992 and  
15 2007 because "low turbidity conditions" existed in Clifton Court  
16 Forebay. BiOp at 164.  
17

18 This is explained in the graph itself. *Id.* (1987, 1989-92,  
19 1994, and 2007 were excluded because those years exhibited low  
20 (<12ntu) average water turbidity during Jan-Feb at Clifton Court  
21 Forebay). The BiOp explains that turbidity is a potential  
22 indicator of smelt presence or movement. BiOp at 151. The BiOp  
23 presents defensible grounds for excluding these data points;  
24

---

25 <sup>34</sup> The opening paragraph of the section of Plaintiffs' motion for summary  
26 judgment addressing the selective use of data also asserts that this practice  
27 tainted the BiOp's justification for monthly flow requirements under RPA  
28 Action 4 and examination of the effects to the species of exports of Article  
21 water by the SWP. Doc. 551 at 25. However, these two additional arguments  
were not discussed or supported in the text of Plaintiffs motion. They will  
not be addressed.

1 Plaintiffs do not provide any evidence suggesting these  
2 exclusions were scientifically improper. There is no independent  
3 legal reason why FWS should be precluded from excluding certain  
4 data points if scientifically justified.

5 Under its mandate to utilize the best available science, FWS  
6 "cannot ignore available, relevant biological information."  
7  
8 *Conner v. Burford*, 848 F.2d 1441, 1454 (9th Cir. 1988); *Kandra v.*  
9 *United States*, 145 F. Supp. 2d 1192, 1208 (D. Or. 2001).

10 Plaintiffs cite *Sierra Club v. EPA*, 346 F.3d 955, 961 (9th Cir.  
11 2003), for the proposition: "[t]he inclusion of data for one  
12 purpose and the exclusion of the same data for another,  
13 intimately related, purpose is impermissible" and "violates the  
14 best available science standard." Doc. 551 at 27. *Sierra Club*  
15 does not stand for such a proposition. The *Sierra Club*  
16 plaintiffs challenged EPA's conclusion under the Clean Air Act  
17 that exceedences of air pollution standards on two particular  
18 days in Imperial County, California were caused by transborder  
19 emissions from Mexico. 346 F.3d at 959-60. The Ninth Circuit  
20 recognized that "where, as here, a court reviews an agency action  
21 'involv[ing] primarily issues of fact,' and where 'analysis of  
22 the relevant documents requires a high level of technical  
23 expertise,' we must 'defer to the informed discretion of the  
24 responsible federal agencies.'" *Id.* at 961 (quoting *Marsh*, 490  
25 U.S. at 377). Such deference was not owed where the agency  
26  
27  
28

1 decision "is without substantial basis in fact." *Id.* EPA's  
2 decision was vacated after plaintiffs presented uncontested  
3 evidence, based on wind data, that the pollution at issue was not  
4 caused by transborder emissions. *Id.* at 961-62. Nowhere did the  
5 Ninth Circuit discuss or find that EPA included data for one  
6 purpose while excluding it for some other related purpose, nor  
7 did it evaluate or even mention the ESA's best available science  
8 standard. Plaintiffs' argument is without legal or factual  
9 support.  
10

11  
12 b. FWS's Use of Data to Examine the Relationship  
13 Between OMR Flows and Salvage and Exclusion of  
that Data from the Incidental Take Limit Analysis.

14 Plaintiffs next argue that FWS acted unlawfully by  
15 selectively using certain data when examining, the relationship  
16 between negative OMR flows and entrainment while excluding that  
17 same data from the calculation of the incidental take limit.

18 Where FWS concludes that "an action (or the implementation  
19 of any reasonable and prudent alternatives) and the resultant  
20 incidental take of listed species will not violate section  
21 7(a)(2) ... the Service will provide with the biological opinion  
22 a statement concerning incidental take." 50 C.F.R. §  
23 402.14(i)(1); see also 16 U.S.C. § 1536(b)(4); BiOp at 285-93.  
24 The Incidental Take Statement ("ITS") provides an exemption from  
25 the take prohibitions of ESA section 9 when the agency can  
26 demonstrate compliance with its terms and conditions.  
27  
28

1 Consultation Handbook 4-47. It "specifies the impact, i.e., the  
2 amount or extent, of such incidental taking on the species," with  
3 an estimate of the number of individuals reasonably likely to be  
4 taken with full implementation of the RPA.<sup>35</sup> 50 C.F.R. §  
5 402.14(i)(1)(i); Consultation Handbook 4-50.  
6

7 The Consultation Handbook enumerates three criteria for ITS  
8 take: (1) the take must not be likely to jeopardize the  
9 continued existence of listed species or destroy or adversely  
10 modify designated critical habitat; (2) it must result from an  
11 otherwise lawful activity; and (3) it must be incidental to the  
12 purpose of the action. Consultation Handbook 4-48. An agency  
13 action can meet the first criterion if the RPA eliminates the  
14 likelihood of jeopardy to the species or adverse modification of  
15 designated critical habitat. *Id.* If FWS determines that full  
16 implementation of the RPA is not likely to result in jeopardy to  
17 the species or destruction or adverse modification of critical  
18 habitat, the ITS is its estimate of the number of individuals  
19  
20

---

21 <sup>35</sup> Federal Defendants note that there is no requirement that an ITS  
22 identify an anticipated number of listed species to be taken. See *Ariz.*  
23 *Cattle Growers*, 273 F.3d at 1249 ("We have never held that a numerical limit  
24 is required"); *Pacific Nw. Generating Coop. ("PNGC") v. Brown*, 822 F. Supp.  
25 1479, 1510 (D. Or. 1993), *aff'd*, 38 F.3d 1058 (9th Cir. 1994). In rejecting  
26 such an argument in PNGC, the District of Oregon cited legislative history  
27 that "demonstrates that Congress fully anticipated that there would be  
28 occasions when impacts would have to be estimated." *Id.* (citing S. Rep. No.  
97-418, 97th Cong. 2d Sess. 21 (1982), U.S.C.C.A.N. 1982, p. 2807 (take  
specification not a "quota" requirement)). The court also noted that other  
legislative history stated, "The Committee ... does not intend that the  
Secretary will, in every instance, interpret the word 'impact' to be a precise  
number...For example, it may not be possible to determine the number of eggs  
of an endangered or threatened fish which will be sucked into a power plant  
...." *Id.* (citing H.R. Rep. No. 97-567, 97th Cong., 2d Sess. 27 (1982),  
U.S.C.C.A.N. 1982, p. 2827)).

1 which will be taken once the RPA is implemented. If this number  
2 is exceeded, the agency must immediately reinstate consultation  
3 with FWS. 50 C.F.R. § 402.14(i)(4).

4 FWS provided an ITS in the BiOp that sets forth the  
5 anticipated level of take that will occur as a result of CVP/SWP  
6 operations under the RPA. The BiOp employs an adaptive approach  
7 that utilizes a formula to compute the take limit each year using  
8 the prior Fall Midwater Trawl Index. BiOp at 287, 383-86. The  
9 ITS provides separate estimates of the amount of take anticipated  
10 for adult and larval/juvenile life stages of delta smelt upon  
11 full implementation of the RPA. *Id.*

12  
13 BiOp Appendix C explains the methods FWS used to determine  
14 adult and juvenile take. To estimate the amount of take, FWS  
15 approximated salvage that would be expected under similar  
16 conditions, based upon recent historic data from the export  
17 salvage facilities.<sup>36</sup> Goude Decl., Doc. 470, at ¶ 14. As Ms.  
18 Goude explains, the procedure FWS used yields a discrete value  
19 for take as salvage so that the adaptive process can operate  
20  
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22  
23 <sup>36</sup> Ms. Goude explains in her declaration that the actual number of fish  
24 "salvaged" -- that is, recovered and counted at the export facility fish  
25 screens -- is a small proportion of those actually lost due to CVP/SWP  
26 operations. Goude Decl., Doc. 470, at ¶ 16. Pre-screen losses (e.g., those  
27 that occur as they enter the structures of the export salvage facilities) can  
28 account for additional sources of mortality that remain uncounted, but have  
been shown to be significant for delta smelt and salmonids. See BiOp at 209.  
Also, delta smelt smaller than 20mm long are not counted in salvage counts,  
thus significant, uncounted losses of juveniles can occur. Goude Decl., Doc.  
470, at ¶ 16. For these reasons, salvage is not a completely accurate measure  
of actual project take via entrainment. *Id.*

1 relative to an estimate of the absolute number of fish extant in  
2 the system. *Id.* at ¶ 15. The calculation of incidental take  
3 varies by year under this methodology, depending on the previous  
4 year's FMWT index. This allows take to increase as delta smelt  
5 abundance increases. *Id.* Conversely, when the FMWT index is  
6 low, the permissible level of take is also reduced. *Id.*  
7

8 The BiOp sets an incidental take limit for pre-spawning  
9 adult delta smelt based on "[t]he average [cumulative salvage  
10 index] value for [water years] 2006 to 2008...." BiOp at 287.  
11 According to FWS, the years 2006, 2007 and 2008 data were  
12 selected because "these years within the historic dataset best  
13 approximate expected salvage under RPA Component 1." *Id.* In  
14 contrast, FWS relied on a graph that excluded data from 2007 when  
15 it analyzed the related "OMR-Salvage relationship for adult delta  
16 smelt" which underlies RPA Component 1 and the Project Effects  
17 Analysis. BiOp at 348. Plaintiffs argue that "the 2007 data  
18 should have been included in the above-described analyses or  
19 excluded from both." Doc. 551 at 27. Plaintiffs point out that  
20 the inclusion of the 2007 data in calculating the incidental take  
21 limit lowered the average cumulative salvage index value and, the  
22 take limit ultimately imposed. See Deriso Decl., Doc. 396, at ¶  
23 99 (explaining that exclusion of the 2007 data increased the take  
24 coefficient from 7.25 to 10.45). Plaintiffs maintain that FWS  
25 unjustifiably included 2005 data in setting the juvenile take  
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1 limit, but excluded the data in setting the adult take limit.

2 The BiOp explains why these years were used. In estimating  
3 conditions under which take would occur, FWS initially restricted  
4 itself to those years where active adaptive management was used  
5 to reduce entrainment and salvage was similar to that expected by  
6 RPA operations. See BiOp 385-86. Only two years are comparable  
7 to this scenario, 2007 and 2008. In order to increase sample  
8 size for what FWS knew was a rough estimate, the BiOp utilized  
9 the range 2006 to 2008 for adult smelt entrainment, and 2005-2008  
10 for juvenile smelt entrainment. Goude Decl., Doc. 470, at ¶ 14;  
11 see BiOp at 382-96.  
12

13 Plaintiffs rejoin that “[i]t was per se unreasonable for FWS  
14 to make use of the 2007 salvage data in calculating the ITS  
15 because it “best approximate[d] expected salvage under RPA  
16 Component 1,” after earlier rejecting the same data for Fig. B-13  
17 because it was unrepresentative of salvage trends, and thus could  
18 not be used to calculate the OMR flow limits for RPA Component  
19 1.” Doc. 697 at 43.  
20

21 However, such data was used for an entirely different  
22 purpose in these two scenarios. Figure B-13 was applied to  
23 examine the point at which negative OMR flows posed an  
24 unacceptable danger to the smelt. It was premised on a data set  
25 of more than 20 years. It was reasonable under those  
26 circumstances to exclude data that accounted for confounding  
27  
28



1 factors, such as turbidity. FWS determined that the best way to  
2 calculate the ITS (which seeks to estimate take levels that will  
3 occur if the RPA Actions are implemented) was to look at years in  
4 which flow restrictions similar to those imposed by the RPA  
5 Actions were in place. This data set was far smaller, arguably  
6 justifying the inclusion of 2007.  
7

8 Plaintiffs' argument that 2007 should have been treated as  
9 an "outlier" for purposes of the ITS is not accurate. As Federal  
10 Defendants explain:

11 [D]ata from 2007 [] is, in actuality, data from  
12 conditions similar to those under the RPA - where there  
13 was salvage under adaptive management to reduce  
14 entrainment. Goude Decl. at ¶ 14. The estimates  
contained in the ITS are intended to reflect operations  
during a full range of year-types, not just those years  
when smelt entrainment is highest.

15 Doc. 660 at 53-54.

16 Plaintiffs' assertion that the sample size of years was too  
17 small presents a scientific dispute. In preparing the ITS, FWS  
18 selected years for inclusion to replicate expected operations  
19 under the RPA. BiOp at 287. Due to limited data, FWS exercised  
20 scientific discretion to select the "most appropriate" years to  
21 estimate the level of incidental take.  
22

23 As to the inclusion of 2005 in the calculation for the  
24 juvenile take limit, but not in the adult take limit, the BiOp  
25 states:

26 The mean values from 2005-2008 were used as an estimate  
27 of take under the RPA. The reason for selecting this  
28 span of years is that the apparent abundance of delta

1 smelt since 2005 as indexed by the 20-mm Survey and the  
2 TNS is the lowest on record. It was necessary to  
3 separate out this abundance variable, but also to  
4 account for other poorly understood factors relating  
salvage to OMR, distribution, and the extant  
conditions....

5 BiOp at 289. Federal Defendants also attempt to provide an  
6 explanation based on the record:

7 [T]he Service explained the separate treatment of  
8 juveniles and adults, noting that "individuals of the  
9 larval/juvenile lifestage are less demographically  
10 significant than adults." BiOp at 289. Plaintiffs  
11 acknowledge - but dismiss - the biological  
12 justification that the Service provided for considering  
13 2005 for juveniles: "the apparent abundance of delta  
smelt since 2005 ... is the lowest on record." BiOp at  
289. Based on information from the summer townet  
survey and the 20mm Survey, it was reasonable for the  
Service to include the 2005 juvenile data in its  
computations. BiOp at 392.

14 Doc. 660 at 53. These justifications do not explain why the  
15 approach used to select the years for the adult ITS (years in  
16 which conditions mimicked those under the RPA) was abandoned for  
17 criteria based upon low smelt abundance. FWS has not provided a  
18 rational explanation for this aspect of the ITS.

19 Plaintiffs argue the 2006 data point should be excluded from  
20 the ITS calculation for larval/juvenile smelt, because that year  
21 was "one of only three years in the entire multi-decade sample in  
22 which OMR flow was positive, resulting in almost zero salvage.  
23 See BiOp at 254." Doc. 551 at 32 (noting that the juvenile  
24 salvage index was 0.4 in 2006, compared with values of 23.4 for  
25 2005, 65.1 for 2007, and 60.9 for 2008). Plaintiffs argue that  
26 the use of the 2006 data point to calculate the larval/juvenile  
27  
28

1 ITS was unreasonable because it was entirely unrepresentative of  
2 normal salvage levels. Plaintiffs also point out that removing  
3 unrepresentative data points "significantly increases the take  
4 level." Deriso Decl., Doc. 396, at ¶ 105. Federal Defendants do  
5 not address this potential flaw in the logic underlying the  
6 juvenile/larval ITS. Because the juvenile/larval ITS must be  
7 remanded on other grounds, FWS should explain why 2006 was  
8 included.  
9

10  
11 c. DWR's Additional Challenges the ITS.

12 DWR contends the ITS is flawed because it depends on the  
13 average cumulative salvage index of the years selected. Because  
14 the incidental take estimate is based on an average, there is  
15 theoretically a 50% chance each year that the estimate will be  
16 exceeded, and a corresponding 50% chance that the agency will  
17 have to reinitiate the consultation. Doc. 548 at 11-12. The  
18 estimate would have been exceeded in two of the three years used  
19 to calculate it.  
20

21 The record does not explain why an "averaging" approach was  
22 used. As part of the process of formulating the ITS, FWS  
23 generated a "Concern Level" estimate, "meant to indicate salvage  
24 levels approaching the take threshold." BiOp at 387. FWS  
25 expressed its "belief" that the "Concern Level" should "trigger  
26 at 75 percent of the adult incidental take, as an indicator that  
27 operations need to be more constrained to avoid exceeding the  
28

1 incidental take." *Id.* This means the ITS is not only a  
2 threshold used to trigger reconsultation; it also functions as an  
3 action that influences operations under the RPA.

4 Based on known adverse water supply consequences of  
5 operating the Projects in a "constrained" manner, it is  
6 inexplicable that FWS did not provide a clear and rational  
7 explanation of how the ITS is set. A court, "cannot infer an  
8 agency's reasoning from mere silence," and "an agency's action  
9 must be upheld, if at all, on the basis articulated by the  
10 agency." See *PCFFA*, 426 F.3d at 1091. Because no such  
11 explanation or basis is provided, the entire ITS must be remanded  
12 for the required justifying explanation.  
13

14 DWR further maintains that the BiOp incorrectly calculated  
15 the number of years in which the incidental take limit was  
16 historically violated. The BiOp states that the take estimate  
17 would be exceeded only five out of the fifteen years between 1993  
18 and 2008. BiOp at 386. This conclusion results from an error.  
19 BiOp Table C-1, calculating the number of years the take estimate  
20 was exceeded, actually shows that this threshold would be  
21 exceeded not only in the five identified years, but in six more  
22 years, including two of the years (2006 and 2008) that FWS  
23 believes best approximate the future with the RPA fully  
24 implemented, a total of eleven out of the sixteen years. *Id.*  
25 FWS must correct these errors on remand.  
26  
27  
28

1           (6) Challenges to the BiOp's Analysis of the Hydrodynamic  
2           Effects of the Projects.

3           Plaintiffs next challenge the BiOp's Project Effects  
4           Analysis as unlawful, because it: (1) bases the analysis of  
5           effects of Project Operations on the improper assumption that  
6           such operations "control" or "drive" hydrodynamic conditions in  
7           the Delta, and (2) then determines, relying on this assumption,  
8           that because CVP and SWP operations drive the hydrodynamic  
9           conditions in the Delta, those operations are the indirect cause  
10          of harm to delta smelt; when in truth a multitude of other causes  
11          ranging from predation to the adverse effects associated with  
12          invasive species contribute to the delta smelt's currently low  
13          population levels.  
14

15          The BiOp explains:

16                   [There are a] multitude of factors that affect delta  
17                   smelt population dynamics including predation,  
18                   contaminants, introduced species, entrainment, habitat  
19                   suitability, food supply, aquatic macrophytes, and  
20                   microcystis. The extent to which these factors  
21                   adversely affect delta smelt is related to hydrodynamic  
22                   conditions in the Delta, which in turn are controlled  
23                   to a large extent by CVP and SWP operations. . . . So  
24                   while many of the other stressors that have been  
25                   identified as adversely affecting delta smelt were not  
26                   caused by CVP and SWP operations, the likelihood and  
27                   extent to which they adversely affect delta smelt is  
28                   highly influenced by how the CVP/SWP are operated in  
                 the context of annual and seasonal hydrologic  
                 conditions. While research indicates that there is no  
                 single primary driver of delta smelt population  
                 dynamics, hydrodynamic conditions driven or influenced  
                 by CVP/SWP operations in turn influence the dynamics of  
                 delta smelt interaction with these other stressors  
                 (Bennett and Moyle 1996).

1 BiOp at 202. Plaintiffs take issue with the logic and science of  
2 this opinion, asserting: (1) in reality, Project Operations do  
3 not "control" or "drive" hydrodynamic conditions in the Delta;  
4 and (2) hydrodynamic conditions in the Delta do not exert a "high  
5 degree of influence" over the other stressors on delta smelt and  
6 its habitat, which operate independently.  
7

8 a. Project Operations as a Driver of Hydrodynamic  
9 Conditions in the Delta.

10 Plaintiffs complain that the BiOp "simply assumed that  
11 Project Operations drive hydrodynamics thereby exacerbating the  
12 effects of other causes of harm on the delta smelt," although the  
13 contrary is established by the record. Doc. 551 at 53.

14 Plaintiffs maintain that Project Operations do not control  
15 precipitation patterns, which are the real drivers of inflow to  
16 the Delta watershed. *Id.*<sup>37</sup>  
17

18 CALFED scientists concluded in a 2008 Report:

19 Despite California's extensive system of water storage  
20

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21 <sup>37</sup> In a related argument, Plaintiffs challenge the BiOp's conclusion that  
22 the long-term upstream shift in the position of X2 was driven by Project  
23 Operations. Plaintiffs insist that the premise that Project operations drive  
24 hydrodynamic conditions in the Delta is unsupported by the record and best  
25 available science. Rather, they insist historic change in X2 was primarily  
26 driven by non-Project causes. Doc. 697 at 38. The majority of evidence  
27 provided by Plaintiffs in support of this argument, cited in their Reply  
28 brief, is inadmissible on summary judgment. For example, Plaintiff's cite  
paragraph 5 of the Reply Declaration of Dr. Charles Hanson, Doc. 598, which  
was stricken from the record, see Doc. 750 at ¶ 10. Plaintiffs also cite  
extensively to the transcript from the evidentiary hearing on the motion for  
preliminary injunction. Plaintiffs have provided no authority that the  
testimony of witnesses at a post-record hearing is admissible under any of the  
exceptions to the general rule prohibiting consideration of extra-record  
evidence, except to explain scientific matter and to determine if the  
information was considered by the agency.

1 and flow management, there is growing evidence that our  
2 capacity to manage water supply and water quality is  
3 limited. For example, there is no getting around the  
4 fact that natural patterns of precipitation and runoff  
5 drive Central Valley hydrology, and that the salinities  
6 found in the Bay-Delta are driven as much by natural  
7 climate variability as they are by freshwater  
8 management (Knowles 2002).

9 CALFED Science Program, The State of Bay-Delta Science 2008 42-43  
10 (2008), Doc. 199 ("State of Bay-Delta Science").<sup>38</sup> Similarly, Dr.  
11 Kimmerer has stated:

12 Freshwater supply to the San Francisco Estuary depends  
13 on highly variable precipitation patterns and the  
14 effects of extensive water development projects  
15 upstream and within the Delta....

16 \*\*\*

17 Given the extent and magnitude of the water projects,  
18 it may seem paradoxical that most of the interannual  
19 variability in flow patterns in the estuary is due to  
20 variability in precipitation.

21 Wim J. Kimmerer, Open Water Processes of the San Francisco  
22 Estuary: From Physical Forcing to Biological Responses, 2(1) San  
23 Francisco Estuary & Watershed Science 15 (2004), AR 18717-18718.  
24 Indeed, precipitation patterns are highly variable. See State of  
25 Bay-Delta Science at 40-42 ("precipitation patterns are highly  
26 variable from year to year (inter-annually) and within years  
27 (seasonally)"). As a result, "[f]reshwater input to the estuary  
28 is highly variable on all time scales." Wim J. Kimmerer et al.,

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<sup>38</sup> Plaintiffs motion to supplement the record with this document was granted in part, allowing Plaintiffs to reference the document and the Court to consider the document under the relevant factors exception to the administrative record doctrine. Doc. 406 at 4.

1 Variation of Physical Habitat for Estuarine Nekton with  
2 Freshwater Flow in the San Francisco Estuary (May 15, 2008), AR  
3 019016; see also Public Policy Institute of California,  
4 Envisioning Futures for the Sacramento-San Joaquin Delta 102  
5 (2007) (stating that inflows to the Delta "vary greatly across  
6 seasons and years"), AR 019343.  
7

8 The first paragraph of the Effects analysis states that  
9 "hydrodynamic conditions in the Delta... are controlled to a  
10 large extent by CVP and SWP [pumping] operations," and that other  
11 sources of water diversion "when taken together do not control  
12 hydrodynamic conditions throughout the Delta to any degree that  
13 approaches the influence of the Banks and Jones export  
14 facilities." BiOp at 202. This apparent inconsistency with the  
15 science must be considered in light of the BiOp's next page,  
16 which explains that "every day the system is in balanced  
17 conditions, the CVP and SWP are [] primary driver[s] of delta  
18 smelt abiotic and biotic habitat suitability, health, and  
19 mortality." BiOp at 203. The BiOp does not assume that pumping  
20 operations continuously drive hydrodynamic conditions; rather,  
21 Project operations primarily drive hydrodynamic conditions when  
22 the system is in balance.<sup>39</sup> With this qualification, the studies  
23  
24

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25  
26 <sup>39</sup> The BiOp explains: "Balanced water conditions are defined in the COA  
27 as periods when it is mutually agreed that releases from upstream reservoirs  
28 plus unregulated flows approximately equal[] the water supply needed to meet  
Sacramento Valley in-basin uses plus exports. Excess water conditions are  
periods when it is mutually agreed that releases from upstream reservoirs plus



1 cited by Plaintiffs do not conflict with the BiOp.

2 The scientific literature does a side-by-side analysis.  
3 Kimmerer (2004) finds that "most of the interannual variability  
4 in flow patterns in the estuary is due to variability in  
5 precipitation ... due to the overwhelming effect of high flow  
6 events." AR 18718. He describes the following impacts of the  
7 CVP-SWP:  
8

9 The water projects have clearly affected the seasonal  
10 patterns of flow into the estuary (Kimmerer 2002b).  
11 Springtime flow has decreased significantly relative to  
12 unimpaired flow because of shifts in water project  
13 operations each year from flood management in winter,  
14 during which reservoirs are kept at relatively low  
15 levels, to water storage in spring, when much of the  
16 flow is captured for subsequent irrigation. In  
17 addition, flow in summer and early fall is higher than  
18 unimpaired flow to support demand for irrigation and  
19 urban use, much of which is met by releases from  
20 reservoirs into the rivers and subsequent recapture and  
21 export from the Delta (Arthur et al. 1996).

22 *Id.* While the CALFED report observes that "natural patterns of  
23 precipitation and runoff drive Central Valley hydrology," it also  
24 finds that "[r]ecent examination of the impacts of water project  
25 development in the state has documented species population losses  
26

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27 unregulated flow exceed Sacramento Valley in-basin uses plus exports.  
28 Reclamation's Central Valley Operations Office (CVOO) and DWR's SWP Operations  
Control Office jointly decide when balanced or excess water conditions exist."  
BiOp at 19.

"The duration of balanced water conditions varies from year to year.  
Some very wet years have had no periods of balanced conditions, while very dry  
years may have had long continuous periods of balanced conditions, and still  
other years may have had several periods of balanced conditions interspersed  
with excess water conditions. Account balances continue from one balanced  
water condition through the excess water condition and into the next balanced  
water condition. When the project that is owed water enters into flood control  
operations, at Shasta or Oroville, the accounting is zeroed out for that  
respective project. The biological assessment provides a detailed description  
of the changes in the COA." BiOp at 20-21.

1 due to destruction of habitat, alteration of flow timing and  
2 changes in water chemistry, water velocities and runoff  
3 quantities." Doc. 199-4 at 15.

4 The BiOp recognizes that "delta smelt abundance trends have  
5 been driven by multiple factors, some of which are affected or  
6 controlled by CVP/SWP operations and others that are not.  
7 Notably, the BiOp acknowledges the decline of delta smelt cannot  
8 be explained solely by the effects of CVP/SWP operations." BiOp  
9 at 203. The BiOp's conclusions about the cause and effect of  
10 other stressors are ambiguous. Plaintiffs' quest for precision  
11 in delinking Project operations as the primary driver of smelt  
12 decline is understandable in view of the ambiguity of the BiOp.  
13  
14

15 b. Treatment of Other Stressors.

16 Plaintiffs complain that the BiOp attributes a wide variety  
17 of causes of harm to delta smelt and its habitat—such as aquatic  
18 macrophytes, predators, competition, toxic blue-green algae, and  
19 contaminants—to continued Project Operations, without any  
20 meaningful explanation. See BiOp at 182-188, 202-203.  
21

22 The BiOp concludes:

23 Other baseline stressors will continue to adversely  
24 affect the delta smelt, such as contaminants,  
25 microcystis, aquatic macrophytes, and invasive species.  
26 Available information is inconclusive regarding the  
27 extent, magnitude and pathways by which delta smelt may  
28 be affected by these stressors independent of CVP/SWP  
operations. However, the operation of the CVP/SWP, as  
proposed, is likely to reduce or preclude seasonal  
flushing flows, substantially reduce the natural  
frequency of upstream and downstream movement of the

1           LSZ, and lengthen upstream shifts of the LSZ to an  
2           extent that may increase the magnitude and frequency of  
3           adverse effects to the delta smelt from these  
4           stressors.

4       BiOp at 277.

5           Plaintiffs argue that the BiOp makes no rational connection  
6       between the other causes of harm to the smelt and their habitat  
7       and continued Project Operations.<sup>40</sup> Plaintiffs acknowledge that  
8       the BiOp contains some discussion of various causes of harm to  
9       delta smelt and their habitat other than from Project Operations,  
10      BiOp at 182-188, but complain that the BiOp "does not  
11      quantitatively (or even qualitatively) explain the [independent]  
12      impact that these causes of harm to the species and its habitat  
13      have on the size of the delta smelt population, nor to the  
14      ostensible ecological pathways by which these environmental  
15      stressors affect the fish." Doc. 551 at 56-57.

17           Plaintiffs argue that the BiOp's treatment of other  
18      stressors conflicts with a "consensus that has emerged over the  
19      last several years in the scientific community that there are a  
20      host of causes of harm to the species that collectively have

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22           <sup>40</sup> Specifically, Plaintiffs maintain that, to comply with the law, FWS  
23      must "(1) analyze the effect that other causes of harm have on the delta smelt  
24      and its habitat; (2) analyze the extent to which hydrodynamics contribute to  
25      each of those other causes of harm to the species and its habitat; (3) analyze  
26      the extent to which Project Operations—as distinguished from the other  
27      operations that result in the diversion of most of the water from the Delta's  
28      watershed—influence hydrodynamics in the Delta watershed; and (4) assess the  
    extent of harm attributable to other causes that can be traced to Project  
    Operations in light of such an analysis." Doc. 551 at 56. Plaintiffs point  
    to no statute, regulation, or caselaw that imposes such specific requirements.  
    Nonetheless, the BiOp must establish a rational connection between the facts  
    and its conclusion that Project Operations exacerbate the impacts of other  
    stressors.

1 contributed to its decline." *Id.* at 57. Plaintiffs point to a  
 2 2007 Public Policy Institute of California Report entitled  
 3 "Envisioning Futures for the Sacramento-San Joaquin Delta" by Jay  
 4 Lund, et al., which discusses how "[s]everal basic assumptions on  
 5 how the [Sacramento-San Joaquin] estuary operates have proven to  
 6 be incorrect or only partially correct." AR 19303. The PPIC  
 7 report describes these revised understandings as a set of  
 8 "paradigm shifts" in Table 4.1, reproduced in substance below:  
 9

10 **Table 4.1**  
 11 **New Understanding of the Delta Ecosystem**

New Paradigm	Old Paradigm
<p>12 <b>1. Uniqueness of the San Francisco Estuary</b></p> <p>13 The San Francisco Estuary has complex tidal hydrodynamics and hydrology. Daily tidal mixing has more influence on the ecology of the estuary than riverine outflows, especially in the western and central Delta. Conditions that benefit striped bass (an East Coast species) do not necessarily benefit native organisms.</p>	<p>The San Francisco Estuary works on the predictable model of East Coast estuaries with gradients of temperature and salinity controlled by outflow. Freshwater outflow is the most important hydrodynamic force. If the estuary is managed for striped bass, all other organisms, and especially other fish, will benefit.</p>
<p>17 <b>2. Invasive Species</b></p> <p>18 Alien species are a major and growing problem that significantly inhibits our ability to manage in support of desirable species.</p>	<p>Alien (nonnative) species are a minor problem or provide more benefits than problems.</p>
<p>20 <b>3. Interdependence</b></p> <p>21 Changes in management of one part of the system affect other parts. All are part of the estuary and can change states in response to outflow and climatic conditions. Floodplains are of major ecological importance and affect estuarine function. Suisun Marsh is an integral part of the estuary ecosystem and its future is closely tied to that of the Delta.</p>	<p>22 The major parts of San Francisco Estuary can be managed independently of one another. The Delta is a freshwater system, Suisun Bay and Marsh are a brackish water system, and San Francisco Bay is a marine system. Floodplains such as the Yolo Bypass have little ecological importance. Suisun Marsh is independent of the rest of the estuary</p>

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<p><b>4. Stability</b></p> <p>The Delta will undergo dramatic changes in the next 50 years as its levees fail because of natural and human-caused forces such as sea level rise, flooding, climate, and subsidence. A Delta ecosystem will still exist, with some changes benefiting native species. Agriculture is unsustainable in some parts of the Delta.</p>	<p>The Delta is a stable geographic entity in its present configuration. Levees can maintain the Delta as it is. Any change in the Delta will destroy its ecosystem. Agriculture is the best use for most Delta lands.</p>
<p><b>5. Effects of Human Activities</b></p> <p>Pumping in the Delta is an important source of fish mortality but only one of several causes of fish declines. Entrainment of fish at the power plants is potentially a major source of mortality. Changes in ocean conditions (El Niño events, Pacific Decadal Oscillation, ocean fishing, etc.) have major effects on the Delta. Hatcheries harm wild salmon and steelhead. Chronic toxicants continue to be a problem, and episodic toxic events from urban and agricultural applications are also a major problem.</p>	<p>Pumping in the southern Delta is the biggest cause of fish declines in the estuary. Fish entrainment at power plants is a minor problem. Changes in ocean conditions have no effect on the Delta. Hatcheries have a positive or no effect on wild populations of salmon and steelhead. Chronic toxicants (e.g., heavy metals, persistent pesticides) are the major problems with toxic compounds in the estuary.</p>

AR 19305-306. The fifth paradigm shift finds that Delta Pumping is an "important source of fish mortality but only one of several causes of fish declines." AR 019306. This finding is further supported by the Interagency Ecological Program's conceptual model that describes observed pelagic fish declines in the Delta and recognizes numerous sources of harm to the species including contaminants, disease, toxic algal blooms, climate change, predation, entrainment in diversions, and limited food availability, limited food co-occurrence with the species, and poor food quality. See Randall Baxter et al., Pelagic Organism Decline Progress Report: 2007 Synthesis of Results (2008)

AR 16935-53. In light of this general, undisputed consensus that many factors contribute to delta smelt mortality, Plaintiffs challenge the BiOp's attribution to the Projects of the effects

1 of: (1) predation; (2) aquatic macrophytes; and (3) microcystis.

2  
3 (1) Predation Analysis.

4 Plaintiffs describe the BiOp's predation as a purportedly  
5 flawed attribution of another stressor to Project Operations.  
6 The BiOp generally acknowledges that striped bass prey on the  
7 delta smelt but concludes that "[i]t is unknown whether  
8 incidental predation by striped bass (and other lesser predators)  
9 represents a substantial source of mortality for delta smelt."  
10 BiOp at 183. The BiOp does not include any estimates of the  
11 effect of predation on the delta smelt population. Such  
12 information was available. The Conservation Plan for DFG's  
13 Striped Bass Management Program ("Conservation Plan"), which was  
14 submitted to FWS as part of an application for an incidental take  
15 permit, states: "[d]espite the low incidence of delta smelt in  
16 striped bass stomachs, the year-round overlap in distribution of  
17 delta smelt and striped bass results in an estimated annual  
18 consumption of about 5.3% of the delta smelt population by a  
19 striped bass population of approximately 765,000 adults." Doc.  
20 181-1 at 32 (emphasis added). The Conservation Plan explains  
21 that FWS and DFG "have agreed that a predation rate of 5.3% of  
22 the annual delta smelt population is a reasonable estimate." *Id.*  
23 at 33. FWS issued an incidental take permit to DFG on the basis  
24 of this striped bass predation estimate. There is question  
25 whether this underestimates the effect on delta smelt of bass  
26  
27  
28

1 predation. See First Amended Complaint, *Coalition v. McCamman*,  
2 1:08-cv-00397 OWW GSA, Doc. 46.

3 FWS need not include every piece of available information  
4 regarding other stressors in the BiOp. *Kempthorne*, 506 F. Supp.  
5 2d at 367 ("If FWS was required to consider and address every new  
6 piece of information it received prior to publication of its  
7 decision, it would be effectively impossible for the agency to  
8 complete a biological opinion."). However, FWS cannot ignore  
9 relevant information pertaining to a major source of mortality to  
10 the species, particularly when that information is decidedly  
11 contrary to BiOp findings. It is not clear from the record  
12 whether 5.6% mortality should be considered significant. In  
13 related contexts, mortality of 1% has been used as an incidental  
14 take limit, see Findings of Fact and Conclusions of Law Re  
15 Existence of Irreparable Harm, *PCFFA v. Gutierrez*, 1:06-cv-00245  
16 OWW GSA, Doc. 367 at 48:5-9 (noting that incidental take limit  
17 for winter-run Chinook salmon is set at two percent of the  
18 estimated number of juveniles produced each year), suggesting  
19 that such small percentages may be significant enough to merit  
20 discussion. The 5.3% figure may be partially attributable to  
21 Project operations. As the BiOp explains, there are high rates  
22 of predation in Clifton Court Forebay, BiOp 160-161, 209, but the  
23 contribution of striped bass predation to this mortality is not  
24 articulated. The BiOp erroneously failed to consider available  
25  
26  
27  
28

1 information regarding the magnitude of striped bass predation on  
2 delta smelt, with the likely result of erroneously attributing to  
3 the Projects, impacts independent of Project Operations.  
4

5 (2) Aquatic Macrophytes.

6 The BiOp discusses aquatic macrophytes:

7 In the last two decades, the interior Delta has been  
8 extensively colonized by submerged aquatic vegetation.  
9 The dominant submerged aquatic vegetation is *Egeria*  
10 *densa*, a nonnative from South America that thrives  
11 under warm water conditions. Research suggests that  
12 *Egeria densa* has altered fish community dynamics in the  
13 Delta, including increasing habitat for centrarchid  
14 fishes including largemouth bass (Nobriga et al. 2005;  
15 Brown and Michniuk 2007), reducing habitat for native  
16 fishes (Brown 2003; Nobriga et al. 2005; Brown and  
17 Michniuk 2007), and supporting a food web pathway for  
18 centrarchids and other littoral fishes (Grimaldo et al  
19 in review). *Egeria densa* has increased its surface area  
20 coverage by up to 10 percent per year depending on  
21 hydrologic conditions and water temperature (Erin  
22 Hestir personal communication University of California  
23 Davis).

17 *Egeria densa* and other non-native submerged aquatic  
18 vegetation (e.g., *Myriophyllum spicatum*) can affect  
19 delta smelt in direct and indirect ways. Directly,  
20 submerged aquatic vegetation can overwhelm littoral  
21 habitats (inter-tidal shoals and beaches) where delta  
22 smelt may spawn making them unsuitable for spawning.  
23 Indirectly, submerged aquatic vegetation decreases  
24 turbidity (by trapping suspended sediment) which has  
25 contributed to a decrease in both juvenile and adult  
26 smelt habitat. Increased water transparency may delay  
27 feeding and may also make delta smelt more susceptible  
28 to predation pressure.

25 BiOp at 182-183. General discussions of *Egeria densa* are  
26 included in the Critical Habitat section of the BiOp. BiOp at  
27 196, 198, 201. Discussion of PCE # 2 explains:

28 As stated in the Status and Baseline Section, research



1 suggests that the nonnative South American aquatic  
2 plant *Egeria densa* has altered fish community dynamics  
3 in the Delta. In addition to the above-mentioned effect  
4 of overwhelming spawning habitat (PCE #1), *Egeria* and  
5 other submerged aquatic vegetation decreases turbidity  
6 by trapping suspended sediment, thereby decreasing  
7 juvenile and adult smelt habitat (Feyrer et al. 2007;  
8 Nobriga et al. 2008). Increased water transparency may  
9 also make delta smelt more susceptible to predation. It  
10 appears that aquatic macrophytes may have a role in  
11 degrading pelagic habitat to the extent that the  
12 Delta's ability to fulfill its intended conservation  
13 purpose continues to diminish. *Egeria* has the  
14 additional effect of decreasing turbidity, described  
15 above as important to successful feeding of newly-  
16 hatched larval delta smelt. However, there is still  
17 enough turbidity in the Central and South Delta to  
18 initiate larval feeding responses because larvae  
19 collected in the South Delta have comparatively high  
20 growth rates. So while *Egeria* may reduce or eliminate  
21 the extent and quality of spawning habitat for delta  
22 smelt, it is not at this considered to have detectable  
23 effects on spawning or early feeding success.

24 BiOp at 198.

25 The BiOp concludes:

26 Available information is inconclusive regarding the  
27 extent, magnitude and pathways by which delta smelt may  
28 be affected by these stressors independent of CVP/SWP  
operations. However, the operation of the CVP/SWP, as  
proposed, is likely to reduce or preclude seasonal  
flushing flows, substantially reduce the natural  
frequency of upstream and downstream movement of the  
LSZ, and lengthen upstream shifts of the LSZ to an  
extent that may increase the magnitude and frequency of  
adverse effects to the delta smelt from these  
stressors.

29 BiOp at 277. Although a connection may exist, the record does  
30 not reflect any discussion, nor have the parties pointed to any  
31 study, connecting "seasonal flushing flows ... the natural  
32 frequency of upstream and downstream movement of the LSZ, and

1 lengthen[ed] upstream shifts of the LSZ" to the presence of any  
2 aquatic macrophyte. FWS has failed to make a rational connection  
3 between the facts in the record and its conclusions, particularly  
4 when the science indicates the contrary is likely true.  
5

6 (3) Microcystis

7 FWS makes no connection whatsoever between microcystis,  
8 large blooms of toxic blue-green algae, and continued CVP and SWP  
9 operations. See BiOp at 186. In a discussion regarding the  
10 Vernalis Adaptive Management Plan (VAMP) period,<sup>41</sup> FWS stated:  
11

12 Without the flow component, the larval and juvenile  
13 delta smelt would remain in the Central and South  
14 Delta, where they could be exposed to lethal water  
15 temperatures, entrainment at Banks and Jones after the  
16 VAMP export curtailment period, or succumb to predation  
17 or microcystis blooms.

18 BiOp at 224. The BiOp does not analyze the effect that this  
19 asserted increased exposure to other stressors has on the delta  
20 smelt, or how it is caused by Project Operations; rather, FWS  
21 simply concludes without support that this effect buttresses a  
22 determination that the proposed action will jeopardize the delta  
23 smelt.

24 It is undisputed that numerous stressors, including ammonia

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25 <sup>41</sup> "Adopted by the SWRCB in D-1641, the San Joaquin River Agreement  
26 (SJRA) includes a 12-year program providing for flows and exports in the lower  
27 San Joaquin River during a 31-day pulse flow period during April and May. It  
28 also provides for the collection of experimental data during that time to  
further the understanding of the effects of flows, exports, and the barrier at  
the head of Old River on salmon survival. This experimental program is  
commonly referred to as the VAMP (Vernalis Adaptive Management Plan)." BiOp  
at 78.

1 and other toxics, food limitation, predation, the introduction of  
2 non-native species and other factors, all have adverse impacts to  
3 delta smelt. See e.g., BiOp at 182-84 (discussing other  
4 stressors). Yet, the BiOp concludes that Project Operations are  
5 "a primary factor influencing delta smelt abiotic and biotic  
6 habitat suitability, health, and mortality." BiOp at 189  
7 (emphasis added). FWS rationalizes this conclusion, at least in  
8 part, by attributing the impacts of many of the "other stressors"  
9 to the Projects. This attribution has not been justified, nor is  
10 it logical or explained by any science. Given that the impacts of  
11 regulating Project Operations are so consequential, such  
12 unsupported attributions (a result in search of a rationale) are  
13 unconscionable.  
14  
15

16 (7) Indirect Effects Analysis.

17 Plaintiffs assert that the BiOp inappropriately categorizes  
18 adverse effects on delta smelt from limited food supply, invasive  
19 species, and contaminants as "indirect effects" caused by Project  
20 Operations. The Joint Consultation Regulations promulgated by  
21 FWS and NMFS define: "[i]ndirect effects are those that are  
22 caused by the proposed action and are later in time, but still  
23 are reasonably certain to occur." 50 C.F.R. § 402.02 (emphasis  
24 added). The ESA's definition differs from NEPA's definition of  
25 indirect effects of an action: "[i]ndirect effects, which are  
26 caused by the action and are later in time or farther removed in  
27  
28

1 distance, but are still reasonably foreseeable." 40 C.F.R.  
2 § 1508.8(b). In the preamble of the Final Rule adopting the ESA  
3 regulations, FWS explained that it intended a narrower regulatory  
4 definition of indirect effects under the ESA than applied in the  
5 NEPA context (i.e., compare "reasonably certain to occur" with  
6 "reasonably foreseeable"). 51 Fed. Reg. 19,926 (June 3, 1986).  
7  
8 NMFS and FWS contrasted the ESA with NEPA and expressly explained  
9 the intent and rationale for adopting the more narrow "reasonably  
10 certain to occur" standard for indirect and cumulative effects  
11 under ESA:

12 If the jeopardy standard is exceeded, the proposed  
13 Federal action cannot proceed without an exemption.  
14 This is a substantive prohibition that applies to the  
15 Federal action involved in consultation. In contrast,  
16 NEPA is procedural in nature, rather than substantive,  
17 which would warrant a more expanded review of  
18 cumulative effects. Otherwise, in a particular  
19 situation, the jeopardy prohibition could operate to  
20 block "nonjeopardy" actions because future, speculative  
21 effects occurring after the Federal action is over  
22 might, on a cumulative basis, jeopardize a listed  
23 species. Congress did not intend that Federal actions  
24 be precluded by such speculative actions.

25 51 Fed. Reg. at 19,933.

26 Shortly after adoption of the ESA regulations, the Ninth  
27 Circuit confirmed "[t]he reasonably certain to occur" standard  
28 applies to "indirect effects ... caused by the proposed action."  
*Sierra Club v. Marsh*, 816 F.2d 1376, 1388 (9th Cir. 1987); see  
also *Ariz. Cattle Growers Ass'n v. FWS*, 273 F.3d 1229, 1243 (9th  
Cir. 2001) (invalidating several incidental take statements

1 regarding grazing and effects on fish because "it would be  
2 unreasonable for [FWS] ... to impose conditions on otherwise  
3 lawful land use if a take were not reasonably certain to occur as  
4 a result of that activity"); *Ctr. for Biological Diversity v.*  
5 *U.S. Dept. of Hous. & Urban Dev.*, 541 F. Supp. 2d 1091, 1100-01  
6 (D. Ariz. 2008) (dismissing a suit alleging federal agencies had  
7 violated the ESA by failing to analyze the indirect effects of  
8 providing federal funding to local development projects,  
9 concluding that the link between such financial assistance and  
10 groundwater depletion that could harm listed species was "too  
11 attenuated" to meet the standards of 50 C.F.R. § 402.02). "[T]he  
12 mere potential for harm ... is insufficient" to meet the  
13 "reasonably certain to occur" standard. *Ariz. Cattle Growers*  
14 *Ass'n*, 273 F.3d at 1246. Other causes must be addressed applying  
15 this standard.  
16  
17

18  
19 a. Effect of Project Operations on Delta Smelt Food  
Supplies.

20 The BiOp claims that one of "three major seasonally  
21 occurring categories of effects" on delta smelt is "entrainment  
22 of *Pseudodiaptomus forbesi*<sup>42</sup>, the primary prey of delta smelt  
23 during summer-fall." BiOp at 203. The BiOp categorizes this as  
24 an "indirect effect." *id.*, and justifies RPA Component 4 (Action  
25

26  
27  
28 <sup>42</sup> *Pseudodiaptomus forbesi* is a small aquatic copepod introduced into the Delta in 1988, and has since become an important source of prey for delta smelt. BiOp at 184.

1 6)<sup>43</sup> in part by the statement that "[t]he Effects Section  
2 indicates that [*P. forbesi*] distribution may be vulnerable to  
3 effects of exports facilities operations and, therefore, the  
4 projects have a likely effect on the food supply available to  
5 delta smelt." BiOp at 380-81.

6  
7 The relevant section of the effects analysis provides:

8 *Entrainment of Pseudodiaptomus forbesi* (June-September)

9 Historically, the diet of juvenile delta smelt during  
10 summer was dominated by the copepod *Eurytemora affinis*  
11 and the mysid shrimp *Neomysis mercedis* (Moyle et al.  
12 1992; Feyrer et al. 2003). These prey bloomed from  
13 within the estuary's LSZ and were decimated by the  
14 overbite clam *Corbula amurensis* (Kimmerer and Orsi  
15 1996), so delta smelt switched their diet to other  
16 prey. *Pseudodiaptomus forbesi* has been the dominant  
17 summertime prey for delta smelt since it was introduced  
18 into the estuary in 1988 (Lott 1998; Nobriga 2002;  
19 Hobbs et al. 2006). Unlike *Eurytemora* and *Neomysis*,  
20 *Pseudodiaptomus* blooms originate in the freshwater  
21 Delta (John Durand San Francisco State University, oral  
22 presentation at 2006 CALFED Science Conference). This  
23 freshwater reproductive strategy provides a refuge from  
24 overbite clam grazing, but *Pseudodiaptomus* has to be  
25 transported to the LSZ during summer to co-occur with  
26 most of the delta smelt population. This might make  
27 *Pseudodiaptomus* more vulnerable to pumping effects from  
28 the export facilities than *Eurytemora* and *Neomysis*  
were. By extension, the projects might have more effect  
on the food supply available to delta smelt than they  
did before the overbite clam changed the LSZ food web.  
As evidence for this hypothesis, the IEP Environmental  
Monitoring Program zooplankton data show the summertime  
density of *Pseudodiaptomus* is generally higher in the  
South Delta than in Suisun Bay. The ratio of South  
Delta *Pseudodiaptomus* density to Suisun Bay  
*Pseudodiaptomus* density was greater than one in 73  
percent of the collections from June- September 1988-  
2006. The average value of this ratio is 22, meaning

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<sup>43</sup> Action 6 requires the creation or restoration of 8,000 acres (12.5 square miles) of habitat. BiOp at 379.

1 that on average summer *Pseudodiaptomus* density has been  
2 22 times higher in the South Delta than Suisun Bay.  
3 Densities in the two regions are not correlated ( $P >$   
4 0.30). This demonstrates that the presence of high  
5 copepod densities in the South Delta which delta smelt  
6 do not occupy during summer months, do not necessarily  
7 occur simultaneously in the LSZ where delta smelt rear.

8 There is statistical evidence suggesting that the co-  
9 occurrence of delta smelt and *Pseudodiaptomus forbesi*  
10 has a strong statistical influence on the survival of  
11 young delta smelt from summer to fall (Miller 2007). In  
12 addition, recent histopathological evaluations of delta  
13 smelt have shown possible evidence of food limitation  
14 in delta smelt during the summer (Bennett 2005; Bennett  
15 et al. 2008). However, the glycogen depletion of the  
16 delta smelt livers reported in these studies can also  
17 arise from thermal stress due to high summer water  
18 temperatures (Bennett et al. 2008).

19 BiOp at 228. These observations show that *P. forbesi* from the  
20 southern Delta are an important source of summer food supply to  
21 delta smelt in the lower salinity zone ("LSZ"), and that Project  
22 Operations (i.e., export pumping) prevent *P. forbesi* in the South  
23 Delta from flowing to the LSZ during that time, causing a  
24 reduction in the density of *P. forbesi* that subsequently causes  
25 deleterious effects to delta smelt.

26 Federal Defendants are correct that nothing in the ESA  
27 requires FWS to rule out all other potential factors that may or  
28 may not play a role in the ecosystem under analysis. See Doc.  
660 at 58. However, the ESA does require the agency to evaluate  
the impacts of the proposed action, and make a determination  
whether the proposed action is likely to have direct and indirect  
effects on the species. 50 C.F.R. § 402.02 (defining "jeopardize

1 the continued existence of" to means "to engage in an action that  
 2 reasonably would be expected, directly or indirectly, to reduce  
 3 appreciably the likelihood of both the survival and recovery of a  
 4 listed species in the wild by reducing the reproduction, numbers,  
 5 or distribution of that species."). Plaintiffs argument is  
 6 simply that "there was no data or analysis in the BiOp (or  
 7 elsewhere in the record) to support the BiOp's finding that  
 8 export pumping causes reduced availability of [*P. forbesi*] for  
 9 consumption by delta smelt in the Low Salinity Zone and that this  
 10 reduced availability is reasonably certain to occur." Doc. 695  
 11 at 55.  
 12

13 Plaintiffs' central complaint is that in evaluating the  
 14 indirect effect of Project operations on *P. forbesi*, FWS used  
 15 data from a few Suisun Bay sampling stations to represent the  
 16 entire lower salinity zone, even though the low salinity zone  
 17 occurs outside Suisun Bay as well.<sup>44</sup> The peer review found a  
 18  
 19

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20  
 21 <sup>44</sup> Plaintiffs also summarily argue that this conclusion is unjustified  
 because:

- 22 • FWS did not consider or rule out the fact that grazing by exotic  
 clam species causes the observed reduced *P. forbesi* density in Suisun Bay.
- 23 • FWS did not consider or rule out the fact that higher densities of  
*P. forbesi* in the South Delta are caused by differences in spatial  
 24 distribution between juvenile and adult *P. forbesi* because juveniles are more  
 dense in the South Delta.
- 25 • FWS did not consider or account for the fact that Plaintiffs  
 provided FWS with results of regression analyses of the best scientific data  
 26 available that showed "[*P. forbesi*] densities in Suisun Bay are not  
 correlated with exports ...," but that there is "a highly significant  
 27 correlation between [*P. forbesi*] densities in Suisun Bay and those in Suisun  
 Marsh, suggesting (unsurprisingly) that if Suisun Bay densities are being  
 28 subsidized, the most likely source is Suisun Marsh." AR 006369; 006377-  
 006378.



1 "relationship between outflow and abundance of *P. forbesi* in the  
2 [lower salinity zone] ... can be detected only by comparing the  
3 distribution of copepods in salinity space rather than relying on  
4 sampling station locations." AR 008821. FWS did nothing to  
5 correct this problem in the final Effects Analysis.

6  
7 Plaintiffs also complain that the BiOp contains no  
8 quantitative analysis of the impact of exports on *P. forbesi*.  
9 Federal Defendants' only response to this criticism is to point  
10 out that the draft BiOp did contain a quantitative analysis.  
11 This draft was presented to the Peer Review panel, which  
12 responded that it "agree[d] with the conceptual model and with  
13 the justification of its elements" as "well-supported," but had  
14 concerns about parts of that analysis, and recommended that it be  
15 revised. Goude Decl., Doc. 470, ¶ 5. The Panel concluded that  
16 if a "revised analysis does not show a substantial (not  
17 necessarily statistically significant) pattern, the analysis  
18 should be mentioned but the results dropped as a quantitative  
19 metric from the [Effects Analysis]." *Id.* After considering the  
20 Panel's recommendation, FWS decided not to use the analysis as a  
21 quantitative metric, instead concluding that a qualitative  
22  
23

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24  
25 Doc. 551 at 48-49. The support for these arguments were incorporated by  
26 reference from the extensive argument concerning the BiOp's food analysis  
27 contained in Plaintiffs' motion for Preliminary Injunction. Given the  
28 prolixity of briefing and the highly contentious process by which page limits  
for the motions for summary judgment were set in this case, it would be highly  
prejudicial to Defendants to permit such extensive incorporation by reference  
into the summary judgment proceedings. These arguments will not be addressed.

1 analysis and discussion was sufficient and appropriate for the  
2 final 2008 Biological Opinion. *Id.* The BiOp does contain a  
3 qualitative discussion of the impacts of the Delta Food Web,  
4 acknowledging the effects that the overbite clam has had on the  
5 pelagic food web, including upon the delta smelt, BiOp at 184-85,  
6 but noting "it is uncertain whether this is a direct consequence  
7 of the overbite clam." BiOp at 184.

9 Although nothing in the ESA mandates the use of quantitative  
10 analyses *per se*, the Peer Review's critique of the *P. forbesi*  
11 analysis cannot be separated from FWS's abandonment of its  
12 quantitative analysis. The Peer Review specifically criticized  
13 the use of fixed-location monitoring sites as part of the  
14 quantitative analysis. Rather than correct this problem, FWS's  
15 response was to abandon the quantitative analysis, choosing to  
16 advance the same, potentially flawed conclusion in a more  
17 subjective, qualitative analysis. This conduct suggests another  
18 unlawful, results-driven choice, ignoring best available science.  
19

20  
21 b. Pollution and Contaminants

22 The BiOp claims "[r]earing habitat in the South Delta may  
23 also be impacted indirectly through increases in contaminant  
24 concentrations." BiOp at 242. In assessing Project effects to  
25 critical habitat, the BiOp states "[t]he contaminant effects may  
26 be generated or diluted by flow depending on the amount of flow,  
27 the type of contaminant, the time of year, and relative  
28

1 concentrations." BiOp at 240.

2 Plaintiffs argue "[g]eneral statements like this do not  
3 comport with ESA's requirements for attributing indirect effects  
4 to an action." Doc. 661 at 50. Plaintiffs contend: "[t]o meet  
5 ESA's regulatory standard for indirect effects," requiring such  
6 indirect effects be "reasonably certain to occur" FWS must  
7 "support these general hypotheses with discussion and use of  
8 scientific data showing":  
9

10 (1) how a specific individual contaminant concentration  
11 (e.g., ammonia, mercury, pyrethroids, etc.) would be  
12 increased by a particular flow modification caused by  
Project Operations;

13 (2) at what time of year or month such flow  
14 modifications and contaminant concentration increases  
would occur; and

15 (3) how and to what extent this alleged contaminant  
16 increase would affect the abundance of delta smelt.

17 *Id.* Plaintiffs do not cite any specific statute, regulation, or  
18 case that requires such specific findings before an impact is a  
19 sufficient indirect effect. The record must reflect that  
20 contaminant-related impacts indirectly caused by Project  
21 Operations are "reasonably certain" to occur. It is undisputed  
22 that contaminants are not introduced by the Projects, rather by  
23 others conducting municipal, industrial, and agricultural  
24 (runoff) activities.  
25

26 FWS provided a qualitative discussion of the impacts of  
27 pollutants and changed Delta hydrodynamics resulting from Project  
28

1 operations upon the smelt:

2 Contaminants

3 Contaminants can change ecosystem functions and  
4 productivity through numerous pathways. However,  
5 contaminant loading and its ecosystem effects within  
6 the Delta are not well understood. Although a number of  
7 contaminant issues were first investigated during the  
8 POD years, concern over contaminants in the Delta is  
9 not new. There are long-standing concerns related to  
10 mercury and selenium levels in the watershed, Delta,  
11 and San Francisco Bay (Linville et al. 2002; Davis et  
12 al. 2003). Phytoplankton growth rate may, at times, be  
13 inhibited by high concentrations of herbicides (Edmunds  
14 et al. 1999). New evidence indicates that phytoplankton  
15 growth rate is chronically inhibited by ammonium  
16 concentrations in and upstream of Suisun Bay (Wilkerson  
17 et al. 2006, Dugdale et al. 2007). Contaminant-related  
18 toxicity to invertebrates has been noted in water and  
19 sediments from the Delta and associated watersheds  
20 (e.g., Kuivila and Foe 1995, Giddings 2000, Werner et  
21 al. 2000, Weston et al. 2004). Undiluted drainwater  
22 from agricultural drains in the San Joaquin River  
23 watershed can be acutely toxic (quickly lethal) to fish  
24 and have chronic effects on growth (Saiki et al. 1992).  
25 Evidence for mortality of young striped bass due to  
26 discharge of agricultural drainage water containing  
27 rice herbicides into the Sacramento River (Bailey et  
28 al. 1994) led to new regulations for water discharges.  
Bioassays using caged Sacramento sucker (*Catostomus  
occidentalis*) have revealed deoxyribonucleic acid  
strand breakage associated with runoff events in the  
watershed and Delta (Whitehead et al. 2004). Kuivila  
and Moon (2004) found that peak densities of larval and  
juvenile delta smelt sometimes coincided in time and  
space with elevated concentrations of dissolved  
pesticides in the spring. These periods of cooccurrence  
lasted for up to 2-3 weeks, but concentrations of  
individual pesticides were low and much less than would  
be expected to cause acute mortality. However, the  
effects of exposure to the complex mixtures of  
pesticides actually present are unknown.

23 The POD investigators initiated several studies  
24 beginning in 2005 to address the possible role of  
25 contaminants and disease in the declines of Delta fish  
26 and other aquatic species. Their primary study consists  
27 of twice-monthly monitoring of ambient water toxicity  
28 at fifteen sites in the Delta and Suisun Bay. In 2005  
and 2006, standard bioassays using the amphipod  
*Hyalella azteca* had low (<5 percent) frequency of  
occurrence of toxicity (Werner et al. 2008). However,  
preliminary results from 2007, a dry year, suggest the

1 incidence of toxic events was higher than in the  
2 previous (wetter) years. Parallel testing with the  
3 addition of piperonyl butoxide, an enzyme inhibitor,  
4 indicated that both organophosphate and pyrethroid  
5 pesticides may have contributed to the pulses of  
6 toxicity. Most of the tests that were positive for *H.*  
7 *azteca* toxicity have come from water samples from the  
8 lower Sacramento River. Pyrethroids are of particular  
9 interest because use of these insecticides has  
10 increased within the Delta watershed (Ameg et al. 2005,  
11 Oros and Werner 2005) as use of some organophosphate  
12 insecticides has declined. Toxicity of sediment-bound  
13 pyrethroids to macroinvertebrates has also been  
14 observed in small, agriculture-dominated watersheds  
15 tributary to the Delta (Weston et al. 2004, 2005). The  
16 association of delta smelt spawning with turbid winter  
17 runoff and the association of pesticides including  
18 pyrethroids with sediment is of potential concern.

19 In conjunction with the POD investigation, larval delta  
20 smelt bioassays were conducted simultaneously with a  
21 subset of the invertebrate bioassays. The water samples  
22 for these tests were collected from six sites within  
23 the Delta during May-August of 2006 and 2007. Results  
24 from 2006 indicate that delta smelt are highly  
25 sensitive to high levels of ammonia, low turbidity, and  
26 low salinity. There is some preliminary indication that  
27 reduced survival may be due to disease organisms  
28 (Werner et al. 2008). No significant mortality of  
larval delta smelt was found in the 2006 bioassays, but  
there were two samples [] collected from sites along  
the Sacramento River and had relatively low turbidity  
and salinity levels and moderate levels of ammonia. It  
is also important to note that no significant *H. azteca*  
mortality was detected in these water samples. While  
the *H. azteca* tests are very useful for detecting  
biologically relevant levels of water column toxicity  
for zooplankton, interpretation of the *H. azteca* test  
results with respect to fish should proceed with great  
caution. The relevance of the bioassay results to field  
conditions remains to be determined.

22 The POD investigations into potential contaminant  
23 effects also include the use of biomarkers that have  
24 been used previously to evaluate toxic effects on POD  
25 fishes (Bennett et al. 1995, Bennett 2005). The results  
26 to date have been mixed. Histopathological and viral  
27 evaluation of young longfin smelt collected in 2006  
28 indicated no histological abnormalities associated with  
exposure to toxics or disease (Foott et al. 2006).  
There was also no evidence of viral infections or high  
parasite loads. Similarly, young threadfin shad showed  
no histological evidence of contaminant effects or of  
viral infections (Foott et al. 2006). Parasites were  
noted in threadfin shad gills at a high frequency but

1 the infections were not considered severe. Both longfin  
2 smelt and threadfin shad were considered healthy in  
3 2006. Adult delta smelt collected from the Delta during  
4 the winter of 2005 also were considered healthy,  
5 showing little histopathological evidence for  
6 starvation or disease (Teh et al., unpublished data).  
7 However, there was some evidence of low frequency  
8 endocrine disruption. In 2005, 9 of 144 (6 percent) of  
9 adult delta smelt males sampled were intersex, having  
10 immature oocytes in their testes (Teh et al.,  
11 unpublished data).

12 In contrast, preliminary histopathological analyses  
13 have found evidence of significant disease in other  
14 species and for POD species collected from other areas  
15 of the estuary. Massive intestinal infections with an  
16 unidentified myxosporean were found in yellowfin goby  
17 *Acanthogobius flavimanus* collected from Suisun Marsh.  
18 Severe viral infection was also found in inland  
19 silverside and juvenile delta smelt collected from  
20 Suisun Bay during summer 2005. Lastly, preliminary  
21 evidence suggests that contaminants and disease may  
22 impair survival of age-0 striped bass. Baxter et al.  
23 2008 found high occurrence and severity of parasitic  
24 infections, inflammatory conditions, and muscle  
25 degeneration in young striped bass collected in 2005;  
26 levels were lower in 2006. Several biomarkers of  
27 contaminant exposure including P450 activity (i.e.,  
28 detoxification enzymes in liver), acetylcholinesterase  
activity (i.e., enzyme activity in brain), and  
vitellogenin induction (i.e., presence of egg yolk  
protein in blood of males) were also reported from  
striped bass collected in 2006 (Ostrach 2008).

18 BiOp at 186-188.

19 It is not clear how the BiOp or any other document in the  
20 record links the impacts of contaminants to Project Operations.  
21 The BiOp does link the position of X2 to the extent of available  
22 delta smelt habitat, suggesting that a more confined habitat "may  
23 increase" the effects of contaminants:  
24

25 During the fall, when delta smelt are nearing  
26 adulthood, the amount of suitable abiotic habitat for  
27 delta smelt is positively associated with X2. This  
28 results from the effects of Delta outflow on salinity  
distribution throughout the Estuary. Fall X2 also has a  
measurable effect on recruitment of juveniles the

1 following summer in that it has been a significant  
2 covariate in delta smelt's stock-recruit relationship  
3 since the invasion of the overbite clam. Potential  
4 mechanisms for the observed effect are two-fold. First,  
5 positioning X2 seaward during fall provides a larger  
6 habitat area which presumably lessens the likelihood of  
7 density-dependent effects (e.g., food availability) on  
8 the delta smelt population. Second, a more confined  
9 distribution may increase the impact of stochastic  
10 events that increase mortality rates of delta smelt.  
11 For delta smelt, this includes predation and  
12 anthropogenic effects such as contaminants and  
13 entrainment (Sommer et al. 2007).

9 BiOp at 234. The Effects on Critical Habitat section states:

10 [T]hrough upstream depletions and alteration of river  
11 flows, the CVP/SWP has played a role in altering the  
12 environment of the Delta. This has resulted in adverse  
13 effects to delta smelt spawning habitat availability  
14 and may mobilize contaminants. The contaminant effects  
15 may be generated or diluted by flow depending on the  
16 amount of flow, the type of contaminant, the time of  
17 the year, and relative concentrations.

15 BiOp at 240.

16 FWS may only count indirect effects as effects of the action  
17 if they are "reasonably certain to occur." FWS's contaminants  
18 analysis does not demonstrate it has complied with this  
19 requirement. It must be done.

21 (8) Critical Habitat as Independent Basis for RPA.

22 Federal Defendants argue that, even if Plaintiffs  
23 demonstrate that the BiOp's "jeopardy" findings were arbitrary  
24 and capricious, the Court should nevertheless deny Plaintiffs'  
25 motion because the RPA is necessary to avoid adverse modification  
26 of the delta smelt's critical habitat. Doc. 660 at 55-58. The  
27 ESA requires, once FWS finds the proposed agency action will  
28

1 result in "jeopardy or adverse modification [of critical habitat]  
2 ... the Secretary shall suggest those reasonable and prudent  
3 alternatives which [it] believes would not violate [Section  
4 7(a) (2)] and can be taken by the Federal agency or applicant in  
5 implementing the agency action." 16 U.S.C. § 1536(b) (3) (A).  
6  
7 Avoiding adverse modification of critical habitat is an  
8 independent statutory basis for promulgation of an RPA. Federal  
9 Defendants maintain that, in light of the statutory mandate to  
10 avoid both jeopardy and adverse modification, Plaintiffs must  
11 make a separate showing, independent of or in addition to their  
12 jeopardy arguments, that the BiOp's findings on critical habitat  
13 are also arbitrary and capricious. This is true in part. To  
14 support a finding that the adverse modification conclusion is  
15 arbitrary and capricious, Plaintiffs must demonstrate either that  
16 the underlying critical habitat analysis was independently flawed  
17 or that the critical habitat analysis was entirely dependent on  
18 flawed aspects of the jeopardy analysis. Whether or not the RPA  
19 and its constituent Actions are erroneous is a separate question.

21 The BiOp makes findings concerning the impact of export  
22 pumping on delta smelt critical habitat, see BiOp at 190-202;  
23 239-244, and concludes:

25 After reviewing the current status of delta smelt  
26 critical habitat, the effects of the proposed action  
27 and the cumulative effects, it is the Service's  
28 biological opinion that the coordinated operations of  
the CVP and SWP, as proposed, are likely to adversely  
modify delta smelt critical habitat. The Service



1 reached this conclusion based on the following  
2 findings, the basis for which is presented in the  
3 preceding Status of Critical Habitat/Environmental  
4 Baseline, Effects of the Action, and Cumulative Effects  
5 sections of this document.

6 1. The conservation role of delta smelt critical  
7 habitat is to provide migration, spawning and rearing  
8 habitat conditions necessary for successful delta smelt  
9 recruitment at levels that will provide for the  
10 conservation of the species. Appropriate physical  
11 habitat (PCE 1), water (PCE 2), river flows (PCE 3),  
12 and salinity (PCE 4) are essential for successful delta  
13 smelt spawning and survival.

14 2. The past and present operations of the CVP/SWP have  
15 degraded these habitat elements (particularly PCEs 2-4)  
16 to the extent that their co-occurrence at the  
17 appropriate places and times is insufficient to support  
18 successful delta smelt recruitment at levels that will  
19 provide for the species' conservation.

20 3. Implementation of the proposed action is expected to  
21 perpetuate the very limited cooccurrence of PCEs at  
22 appropriate places and times by: (a) altering  
23 hydrologic conditions in a manner that adversely  
24 affects the distribution of abiotic factors such as  
25 turbidity and contaminants; (b) altering river flows to  
26 an extent that increases delta smelt entrainment at  
27 Banks and Jones, as well as reduces habitat suitability  
28 in the Central and South Delta; and (c) altering the  
natural pattern of seasonal upstream movement of the  
LSZ to an extent that is likely to reduce available  
habitat for the delta smelt within areas designated as  
critical habitat.

The proposed action does include a provision for VAMP  
to address augmentation of river flow but future  
implementation of this provision is not well defined,  
making its beneficial effects on the PCEs of delta  
smelt critical habitat uncertain.

4. On the basis of findings (1)-(3) above, the Service  
concludes that implementation of the proposed action is  
likely to prevent delta smelt critical habitat from  
serving its intended conservation role.

BiOp 278-79.

1 Plaintiffs respond to Federal Defendants' argument that the  
2 critical habitat analysis is actually flawed in a number of ways:

3 (1) FWS failed to identify the threshold for adverse  
4 modification, or to assess and explain whether the magnitude  
5 and extent of any claimed effects to critical habitat rise  
6 to that threshold level;

7  
8 (2) in making finding 3(a), the BiOp did not provide  
9 analysis or explanation showing how alleged indirect effects  
10 to critical habitat will be caused by Project operations and  
11 will be reasonably certain to occur; and

12 (3) in making findings 3(b) and 3(c), FWS expressly relied  
13 on the flawed analyses of entrainment and X2.

14 Doc. 697 at 64-71:<sup>45</sup>

15  
16 a. Identification of a Threshold For Adverse  
17 Modification/ Explanation of How Any Alleged  
18 Alteration To Critical Habitat Would Exceed that  
Threshold.

19 The BiOp's critical habitat findings 1 and 2 state that  
20 "appropriate" habitat elements are "essential" and have been  
21 "degraded ... to the extent that their co-occurrence at the  
22 appropriate places and times is insufficient to support  
23 successful delta smelt recruitment at levels that will provide  
24 for the species' conservation." BiOp at 278. However,  
25

---

26  
27 <sup>45</sup> Federal Defendants' motion to strike these arguments on the ground  
28 that they were raised for the first time in Plaintiffs' reply brief was  
denied. Federal Defendants were afforded the opportunity to respond, see Doc.  
745 at 2, which they did, see Doc. 746 at 2-7.

1 Plaintiffs complain that the BiOp does not explain the extent of  
2 co-occurrence of habitat elements that is necessary for  
3 conservation of delta smelt; the magnitude of the claimed  
4 degradation of this co-occurrence that is attributable to Project  
5 operations; or why that effect renders the habitat elements  
6 "insufficient" to support the species' recovery. Plaintiffs  
7 argue, without such analysis there is no basis for FWS to  
8 conclude that habitat changes caused by Project operations will  
9 result in adverse modification of critical habitat.  
10

11 Destruction or adverse modification means "a direct or  
12 indirect alteration that appreciably diminishes the value of  
13 critical habitat for both the survival and recovery of a listed  
14 species." 50 C.F.R. § 402.02. Previous rulings in related cases  
15 have held "that NMFS and FWS have interpreted the term  
16 'appreciably diminish' to mean 'considerably reduce.'" Findings  
17 of Fact and Conclusions of Law Re the Existence of Irreparable  
18 Harm, *PCFFA v. Gutierrez*, 1:06-cv-245 OWW GSA, Doc. 367 at 24:6-9  
19 (citing Consultation Handbook at 4-34).  
20

21 Plaintiffs cite *Gifford Pinchot*, 378 F.3d at 1074, and *NWF*  
22 *v. NMFS II*, 524 F.3d at 932 & n.10, for the principle that FWS  
23 must identify a threshold for adverse modification and assess and  
24 explain whether the magnitude and extent of any claimed effects  
25 to critical habitat reach that threshold. These cases do not  
26 support Plaintiff's argument. *Gifford Pinchot* rejected FWS's  
27  
28

1 interpretation of "adverse modification" in a manner that only  
2 triggered an adverse modification finding where there is "an  
3 appreciable diminishment of the value of critical habitat for  
4 both survival and recovery." *Id.* at 1069. After rejecting FWS's  
5 rationale for applying the regulation, the Ninth Circuit reasoned  
6 that the various biological opinions at issue could nevertheless  
7 be found valid if they actually evaluated the impact to recovery.  
8 The *Gifford Pinchot* plaintiffs raised concerns about FWS's  
9 complete failure to address the issue of recovery in that  
10 biological opinion's critical habitat analysis. The Appeals  
11 Court specifically found that FWS detailed the percentage loss of  
12 critical habitat but did not discuss the specific impact of that  
13 loss on recovery, rendering the BiOp insufficient. 378 F.3d at  
14 1074.  
15  
16

17 Following *Gifford Pinchot*, *NWF v. NMFS II* held that NMFS  
18 acted arbitrarily and capriciously by failing to analyze the  
19 impacts of dam operations on the recovery value of critical  
20 habitat. 524 F.3d at 932. NMFS' argument "that it 'implicitly'  
21 analyzed recovery in its survival analysis" was rejected as a  
22 "post hoc justification," because a court cannot consider "an  
23 analysis that is not shown in the record." *Id.* at 932 n.10  
24 (internal citations and quotations omitted). Plaintiffs do not  
25 directly challenge the BiOp's recovery analysis; rather, they  
26 argue that the BiOp should have set a "threshold" for adverse  
27  
28

1 modification. Nothing in *Gifford Pinchot* or *NWF v. NMFS II*  
2 requires FWS to set a "threshold" for adverse modification.

3 *Butte Environmental Council v. U.S. Army Corps of Engineers*,  
4 607 F.3d 570, 582-83 (9th Cir. 2010), suggests exactly the  
5 opposite. *Butte* upheld FWS's determination that destruction of a  
6 very small percentage (less than 1%) of designated critical  
7 habitat would not adversely modify the species' critical habitat.  
8 Relevant here is the Ninth Circuit's rejection of a demand that  
9 FWS address the rate of loss of critical habitat, finding that  
10 nothing in the statute or regulations requires FWS to perform  
11 such a calculation. *Id.*

12  
13 Plaintiffs extensively discuss the BiOp's critical habitat  
14 analysis to attempt to demonstrate the BiOp does not identify a  
15 threshold for adverse modification or what standard for adverse  
16 modification FWS applied. See Doc. 697 at 66-69. Plaintiffs  
17 criticize the individual critical habitat findings for failing to  
18 clearly describe the effects of project operations on the  
19 quantity or quality of the individual habitat elements.

20  
21 This disassembly, focusing on the critical habitat  
22 conclusion, does not consider the BiOp as a whole. The BiOp's  
23 adverse modification determination relies on four components:  
24 "(1) the Status of Critical Habitat... ; (2) the Environmental  
25 Baseline... ; (3) the Effects of the Action... ; and (4)  
26 Cumulative Effects...." BiOp at 139. The Status of the  
27  
28

1 Species/Environmental Baseline sections analyze how project  
2 operations have degraded the PCEs up to the present time, while  
3 the Effects Analysis analyzes how these ongoing operations will  
4 continue to adversely modify critical habitat in the future. See  
5 *id.* at 202-203. Most of the impacts analysis is found in the  
6 Status of the Species / Environmental Baseline section. The  
7 Effects Analysis explains that these well-documented prior  
8 effects will continue due to ongoing Project operations. *Id.*

9  
10 In the discussion of PCE # 2 (water quality, including  
11 abiotic elements), the BiOp explains how this PCE's condition is  
12 substantially degraded by Project operations. FWS found that  
13 project operations cause "[p]ersistent confinement of the  
14 effective spawning population" and otherwise "adversely affect"  
15 turbidity, "reproductive success," the availability of prey, and  
16 the exposure of delta smelt to contaminants and to localized  
17 catastrophic events. *Id.* at 197. Plaintiffs' omnibus complaint  
18 that the critical habitat section entirely lacks analytical  
19 structure is overbroad.  
20

21  
22 b. Reliance On Assumptions Of Indirect Effects  
23 Without Providing Evidence That These Indirect  
Effects Are Reasonably Certain To Occur.

24 Plaintiffs argue BiOp critical habitat finding 3(a), BiOp at  
25 278, is flawed as unsupported by any analysis verifying that  
26 Project-induced changes to Delta hydrodynamics interact with  
27 other abiotic factors to exacerbate the effects of those factors  
28

1 on the delta smelt's critical habitat. Plaintiffs assert the  
2 BiOp's conclusory assertions do not explain how described  
3 indirect effects to critical habitat are reasonably certain to  
4 occur. See 50 C.F.R. § 402.02 (requiring that indirect effects  
5 be reasonably certain to occur).  
6

7 The BiOp concludes the impact of Project Operations on PCE 2  
8 (Water), "[a]s described in the Effects Section, the CVP/SWP  
9 alter the hydrologic conditions within spawning habitat  
10 throughout the spawning period for delta smelt by impacting  
11 various abiotic factors including the distributions of turbidity,  
12 food, and contaminants." BiOp at 239; see also BiOp at 241 ("In  
13 addition, pumping at Banks and Jones can alter flows within the  
14 Delta. This results in a corresponding alteration of larval and  
15 juvenile transport."); BiOp at 242 ("As described in the Effects  
16 Section, the CVP/SWP alter the hydrologic conditions within  
17 rearing habitat throughout the spawning period for delta smelt by  
18 impacting various abiotic factors including distributions of  
19 turbidity, food, and contaminants."); *id.* ("Pumping at Banks and  
20 Jones alters flows within the Delta. As described in the Effects  
21 Section, negative flows can result in an increased risk of  
22 entrainment when rearing habitat includes the South Delta.");  
23 BiOp at 243 ("As stated previously, the CVP/SWP alters the extent  
24 and location of the LSZ by modifying both the Sacramento and San  
25 Joaquin river flows which reduces habitat quality and  
26  
27  
28

1 quantity) .).

2 The BiOp links export pumping and contaminant effects:

3 The CVP and SWP, as analyzed in the Effects Section,  
4 directly influence the location and the amount of  
5 suitable spawning habitat, especially in drier WYs.  
6 Further, through upstream depletions and alteration of  
7 river flows, the CVP/SWP has played a role in altering  
8 the environment of the Delta. This has resulted in  
9 adverse effects to delta smelt spawning habitat  
10 availability and may mobilize contaminants. The  
11 contaminant effects may be generated or diluted by flow  
12 depending on the amount of flow, the type of  
13 contaminant, the time of the year, and relative  
14 concentrations.

15 BiOp at 239. Although, the BiOp supports the conclusion that the  
16 Projects drive hydrodynamics during times of balanced conditions,  
17 nowhere in the BiOp or in any record citation provided by any  
18 party is there any support for the conclusion that Project  
19 operations are reasonably certain to exacerbate contaminant  
20 impacts. It is logical that changes in hydrodynamics could  
21 impact exposure to contaminants in the water, but the extent of  
22 this influence is unknown and unsupported by any analysis or  
23 record citation.

24 c. Reliance on Analysis Of Entrainment and X2 in  
25 Support of the Adverse Modification Determination.

26 Plaintiffs opening brief argued: "the BiOp's determination  
27 that proposed Project Operations will adversely modify critical  
28 habitat rests upon the same defective Project Effects Analysis  
that led FWS to its determination that Project Operations would  
jeopardize the delta smelt." Doc. 551 at 63. The critical



1 habitat conclusion section does explicitly rely on conclusions  
2 reached in the effects analysis' regarding entrainment and the  
3 movement of X2. For example, Critical Habitat conclusion #3  
4 provides:

5  
6 3. Implementation of the proposed action is expected to  
7 perpetuate the very limited co-occurrence of PCEs at  
8 appropriate places and times by: (a) altering  
9 hydrologic conditions in a manner that adversely  
10 affects the distribution of abiotic factors such as  
11 turbidity and contaminants; (b) altering river flows to  
12 an extent that increases delta smelt entrainment at  
13 Banks and Jones, as well as reduces habitat suitability  
14 in the Central and South Delta; and (c) altering the  
15 natural pattern of seasonal upstream movement of the  
16 [Low Salinity Zone ("LSZ")] to an extent that is likely  
17 to reduce available habitat for the delta smelt within  
18 areas designated as critical habitat.

19 BiOp at 278.

20  
21 The BiOp's general conclusion that Project Operations  
22 increase delta smelt entrainment with resulting population-level  
23 impacts within year classes is valid. It is, rather, the BiOp's  
24 quantitative conclusions regarding the exact negative OMR flow  
25 ranges that are unfounded. FWS did not err by incorporating this  
26 general conclusion in its Critical Habitat conclusion.

27  
28 As for the inclusion of the finding that Project Operations  
alter the natural pattern of seasonal movement of the Low  
Salinity Zone ("LSZ"), this underlying conclusion from the  
Effects section is not supported by the record, because it is  
based at least in part on the invalid quantitative analysis using  
the Calsim II to Dayflow comparison. This aspect of the critical

1 habitat analysis is without record support. These areas must be  
2 addressed on remand.

3  
4 (9) Discretionary v. Nondiscretionary Actions.

5 Plaintiffs complain that the BiOp's Project Effects analysis  
6 was "tainted" because it does not distinguish between  
7 discretionary and non-discretionary actions. Doc. 551 at 61-63.  
8 *National Association of Home Builders v. Defenders of Wildlife*,  
9 551 U.S. 644 (2008), held that ESA § 7's consultation  
10 requirements do not apply to non-discretionary actions. Where an  
11 agency is required by law to perform an action, it lacks the  
12 power to insure that the action will not jeopardize the species.  
13 *Id.* at 667. Plaintiffs' cite the Coordinated Operations  
14 Agreement, the Central Valley Project Improvement Act's ("CVPIA")  
15 requirements to deliver water for Central Valley wildlife refuge  
16 areas, and D-1641 as examples of mandatory aspects of Project  
17 operations that, they claim, should have been segregated from  
18 other Project Operations in the Project Effects Analysis.  
19

20  
21 However, Home Builders does not address whether, once  
22 section 7 consultation is triggered, the jeopardy analysis must  
23 separately identify and segregate discretionary from non-  
24 discretionary actions, relegating the non-discretionary actions  
25 to the environmental baseline. *Home Builders* addressed whether  
26 the section 7 consultation obligation attaches to a particular  
27 agency action at all. See *Home Builders*, 551 U.S. at 669-70  
28

1 (holding that consultation "duty does not attach to actions...  
2 that an agency is required by statute to undertake....")  
3 (emphasis added). Plaintiffs do not suggest that section 7 does  
4 not apply to the coordinated operations of the Projects. Rather,  
5 Plaintiffs contend that the section 7 consultation process  
6 requires distinguishing between discretionary and non-  
7 discretionary Project operations to identify the actions not  
8 subject to Section 7. Neither *Home Builders* nor the regulation  
9 interpreted in *Home Builders*, 50 C.F.R. § 402.03, includes any  
10 such requirement. Plaintiffs' motion for summary judgment that  
11 the BiOp unlawfully failed to distinguish between discretionary  
12 and non-discretionary actions is DENIED. This does not mean non-  
13 discretionary actions required by law must not be considered in  
14 the consultation process. Federal Defendants and Defendant-  
15 Intervenor's' cross-motion on identification of non-discretionary  
16 actions is GRANTED.

17  
18  
19  
20 B. Application of the RPA Regulations.

21 Plaintiffs next argue that, in adopting the RPA, Federal  
22 Defendants did not undertake the analysis required by Section 7  
23 and its Joint Consultation Regulations. Doc. 551 at 65-79.  
24 Under the ESA, if a biological opinion concludes that a proposed  
25 agency action will cause jeopardy to a listed species or result  
26 in the destruction or adverse modification of its critical  
27 habitat, "the Secretary shall suggest those reasonable and  
28

1 prudent alternatives which he believes would not violate  
2 subsection (a) (2) and can be taken by the Federal agency or  
3 applicant in implementing the agency action." 16 U.S.C. §  
4 1536(b) (3) (A); 50 C.F.R. § 402.14(h) (3). The Joint Consultation  
5 Regulations define such reasonable and prudent alternatives as  
6 follows:  
7

8 Reasonable and prudent alternatives refer to  
9 alternative actions identified during formal  
10 consultation that can be implemented in a manner  
11 consistent with the intended purpose of the action,  
12 that can be implemented consistent with the scope of  
13 the Federal agency's legal authority and jurisdiction,  
14 that is [sic] economically and technologically  
15 feasible, and that the Director believes would avoid  
16 the likelihood of jeopardizing the continued existence  
17 of listed species or resulting in the destruction or  
18 adverse modification of critical habitat.

19 50 C.F.R. § 402.02; see also 51 Fed. Reg. at 19,958; 50 C.F.R. §  
20 402.14(g) (5); *Home Builders*, 551 U.S. at 652 (Section 402.02  
21 defines what qualifies as an RPA). Under this definition, an RPA  
22 must: (1) be consistent with the purpose of the underlying  
23 action; (2) be consistent with the action agency's authority; (3)  
24 be economically and technologically feasible; and (4) avoid the  
25 likelihood of jeopardy to the species or adverse modification of  
26 its critical habitat. 50 C.F.R. § 402.02; see also 16 U.S.C. §  
27 1536(b) (3) (A); *Greenpeace v. Nat'l Marine Fisheries Serv.*, 55 F.  
28 Supp. 2d 1248, 1264 (W.D. Wash. 1999).

(1) FWS Did Not Explicitly Analyze Any of the Four Factors  
in the BiOp.

It has already been determined that "the BiOp does not

1 explicitly discuss the first three factors -- consistency with  
2 the purpose of the action; consistency with the legal authority  
3 and jurisdiction of the action agency; and economic and  
4 technological feasibility -- at all." Memorandum Decision Re  
5 Cross Motions for Summary Judgment Re Reasonable and Prudent  
6 Alternative Claims, Doc. 354 at 16 ("None of the terms  
7 'consistent with the intended purpose of the action,'  
8 'jurisdiction,' 'legal authority,' or 'economically and  
9 technologically feasible,' are used in the RPA section of the  
10 BiOp."). "[I]t is undisputed that the BiOp's language contains  
11 no such discussion." *Id.* at 21.

12  
13 An October 15, 2009 Decision rejected Plaintiffs' earlier  
14 argument that this analysis must be included "on the face" of the  
15 BiOp. See Doc. 354 at 38. However, the question of whether FWS  
16 properly promulgated the RPA was left to be "decided on the basis  
17 of the entire record." *Id.* at 51. Of the four requirements,  
18 "[j]eopardy has been found to be the 'guiding standard' for  
19 determination of RPAs." *Id.* at 27 (citing *Greenpeace* 55 F. Supp.  
20 2d at 1268). Whether and how the record must demonstrate  
21 compliance with § 402.02 is a separate question.  
22  
23

24 (2) Compliance with § 402.02.

25 Plaintiffs allege that FWS violated the APA because the  
26 administrative record contains no meaningful analysis related to  
27 the first three requirements of § 402.02, and that, while FWS  
28

1       undertook some analysis regarding whether its RPA would avoid  
2       jeopardizing delta smelt (the fourth factor described in §  
3       402.02), that analysis is flawed because it was not based upon  
4       the best available science.

5  
6               a.     Jeopardy Factor (Fourth Factor).

7               Plaintiffs maintain that FWS violated the ESA by adopting  
8       its RPA without providing a reasoned analysis regarding how the  
9       various RPA actions will avoid the likelihood of jeopardizing the  
10      delta smelt or adversely modifying its critical habitat. The  
11      Consultation Handbook directs that "[w]hen a reasonable and  
12      prudent alternative consists of multiple activities, it is  
13      imperative that the opinion contain a thorough explanation of how  
14      each component of the alternative is essential to avoid  
15      jeopardy." Consultation Handbook at 4-43. Plaintiffs do not  
16      dispute that the BiOp contains extensive discussion of the need  
17      for the RPA components. Rather, Plaintiffs contend that the RPA  
18      violates § 402.2 because that discussion is not based on the best  
19      available science.  
20  
21

22              The § 402.02 requirements and the best available science  
23      requirement are separate. It is undisputed that both the BiOp  
24      and its RPA must be based on the best available science, but a  
25      violation of that requirement does not necessarily violate  
26      § 402.02. Whether each part of the jeopardy analysis relies on  
27      the best available science is discussed above. Section 402.02  
28

1 does not provide an independent statutory basis for imposing  
2 liability upon FWS for failing to comply with the best available  
3 science requirement. Plaintiffs' motion for summary judgment on  
4 this ground is DENIED; Federal Defendants' and Defendant-  
5 Intervenor's is GRANTED.  
6

7 b. Non-Jeopardy Factors (Factors One Through Three).

8 It is undisputed that the BiOp contains no explicit  
9 discussion of the first three factors: (1) consistency with the  
10 purpose of the underlying action; (2) consistency with the action  
11 agency's authority; and (3) economic and technological  
12 feasibility. Plaintiffs insist that the ESA and its implementing  
13 regulations require that the record contain explicit "analyses"  
14 of each of the four factors. As authority, Plaintiffs invoke  
15 general principles of Administrative Law, including the rule that  
16 a court "cannot infer an agency's reasoning from mere silence."  
17 See *PCFFA*, 426 F.3d at 1091.  
18

19 It is undisputed that there is no explicit analysis anywhere  
20 in the record of the three non-jeopardy factors. Federal  
21 Defendants and Defendant-Intervenor's dismiss this fact, arguing  
22 (1) that no such explicit analysis is required by law and (2)  
23 that satisfaction of all three factors is so obvious that  
24 explicit analysis is unnecessary. See Doc. 660 at 70-72; Doc.  
25 661-3 at 35-38.  
26

27 Many of the cases upon which the parties now rely were  
28

1 discussed in the October 15, 2009 Decision:

2 Plaintiffs and DWR rely on caselaw to support their  
3 contention that, despite the lack of an explicit  
4 requirement, the BiOp must include findings treating  
5 the first three RPA requirements. It is undisputed  
6 that an agency acts arbitrarily and/or capriciously  
7 when it fails to consider an important aspect of a  
8 problem before it. *Pac. Coast Fed'n of Fishermen's*  
9 *Ass'ns v. NMFS*, 265 F.3d 1028, 1034 (9th Cir. 2001)  
10 ("*PCFFA I*"). But, whether an agency must expressly  
11 consider any particular issue on the face of its  
12 decisional document, as opposed to elsewhere in the  
13 administrative record, is a different question. On the  
14 one hand, an agency action may be upheld even if it is  
15 of "less than ideal clarity" as long as "the agency's  
16 path may reasonably be discerned." *Bowman Transp.,*  
17 *Inc. v. Arkansas-Best Freight System, Inc.*, 419 U.S.  
18 281, 285-86 (1974). However, a court "cannot infer an  
19 agency's reasoning from mere silence..." but must "rely  
20 only on what the agency actually said..." Compare  
21 *Gifford Pinchot Task Force v. U.S. Fish and Wildlife*  
22 *Serv.*, 378 F.3d 1059, 1072 n.9 (9th Cir. 2004) (holding  
23 that the court "may only rely on what the agency said  
24 in the record to determine what the agency decided and  
25 why"); *Pac. Coast Fed'n of Fishermen's Ass'ns v. NMFS*,  
26 426 F.3d 1082, 1092 (9th Cir. 2005) ("*PCFFA II*")  
27 (citing *Gifford Pinchot* for the proposition that a  
28 court must "rely only on what the agency actually said  
in the biological opinion"). Does the caselaw require  
that the RPA requirements be discussed on the face of  
the BiOp?

Plaintiffs place great weight on the Ninth Circuit's  
decision in *Southwest Center for Biological Diversity*  
*v. U.S. Bureau of Reclamation*, 143 F.3d 515, 518 (9th  
Cir. 1998), upholding a FWS biological opinion  
concluding that Reclamation's operations on Lake Mead  
and the Lower Colorado River would jeopardize an  
endangered bird species, the Southwestern Willow  
Flycatcher. Before the BiOp was finalized, FWS sent  
Reclamation a draft RPA comprised of a number of short  
and long-term components. *Id.* Some of the short-term  
measures would have required Reclamation to lower the  
level of Lake Mead. Reclamation advised FWS that it  
lacked discretion to do so. *Id.* FWS's final BiOp  
confirmed that project operations would jeopardize the  
species, but proposed a new RPA which no longer



1 required Reclamation to take the originally-proposed  
2 short term actions, replacing them with other short  
term measures. *Id.*

3 Environmental plaintiffs argued that FWS improperly  
4 rejected the draft RPA in favor of the final RPA, which  
5 does less to preserve habitat near Lake Mead, "based on  
6 Reclamation's alleged lack of discretion to lower the  
7 level of Lake Mead." *Id.* at 523. Specifically,  
8 Plaintiffs complained "that the secretary never  
independently reviewed Reclamation's representation  
that it lacked such discretion." *Id.*

9 The Ninth Circuit rejected this argument on several  
10 grounds. First, "under the ESA, the Secretary was not  
11 required to pick the first reasonable alternative the  
12 FWS came up with in formulating the RPA. The Secretary  
13 was not even required to pick the best alternative or  
14 the one that would most effectively protect the  
Flycatcher from jeopardy.... The Secretary need only  
have adopted a final RPA which complied with the  
jeopardy standard and which could be implemented by the  
agency." *Id.* at 523 (emphasis added).

15 Second, "under the ESA, the Secretary was not required  
16 to explain why he chose one RPA over another, or to  
17 justify his decision based solely on apolitical  
factors.[FN5]" *Id.* Footnote 5 further explains:

18 The Secretary must rely on "the best scientific  
19 and commercial data available" in formulating an  
20 RPA, 16 U.S.C. § 1536(a)(2). However, the ESA does  
21 not explicitly limit the Secretary's analysis to  
22 apolitical considerations. If two proposed RPAs  
would avoid jeopardy to the Flycatcher, the  
Secretary must be permitted to choose the one that  
best suits all of its interests, including  
political or business interests.

23 *Id.*

24 The Ninth Circuit then articulated the governing  
25 standard: "The only relevant question before [the  
26 court] for review was whether the Secretary acted  
27 arbitrarily and capriciously or abused his discretion  
28 in adopting the final RPA." *Id.* "In answering this  
question, the court had only to determine if the final  
RPA met the standards and requirements of the ESA. The  
court was not in a position to determine if the draft

1 RPA should have been adopted or if it would have  
2 afforded the Flycatcher better protection." *Id.*

3 The Ninth Circuit reviewed the evidence and found no  
4 APA violation:

5 Upon careful review of the evidence, we cannot say  
6 the district court erred in finding that the final  
7 RPA met the standards and requirements of the ESA.  
8 The district court determined that the FWS  
9 considered the relevant factors and reasonably  
10 found that the Flycatcher could survive the loss  
11 of habitat at Lake Mead for eighteen months until  
12 500 acres could be protected, then survive an  
13 additional two years until an additional 500 acres  
14 could be protected, and finally survive through  
15 the MSCP process until compensation could be made  
16 for the historical habitat lost on the Lower  
17 Colorado River and until an extensive ecological  
18 restoration could be undertaken. Southwest failed  
19 to present any convincing evidence to contradict  
20 the FWS' findings. Southwest merely relied upon  
21 the discarded draft RPA which had indicated that  
22 preservation of the Lake Mead habitat was  
23 necessary to the survival of the Flycatcher.  
24 However, upon further consideration of the matter,  
25 the FWS was entitled to, and did, in fact, change  
26 its mind. The FWS concluded in the final BO that  
27 the proposed short-term and long-term provisions  
28 of the final RPA would avoid jeopardy to the  
Flycatcher, notwithstanding the failure to modify  
Reclamation's operation of Hoover Dam at Lake  
Mead. Because there was a rational connection  
between the facts found in the BO and the choice  
made to adopt the final RPA, and because we must  
defer to the special expertise of the FWS in  
drafting RPAs that will sufficiently protect  
endangered species, we cannot conclude that the  
Secretary violated the APA.

*Id.* (emphasis added).

25 Plaintiffs argue the emphasized text, approving FWS's  
26 RPA because there was a rational connection between the  
27 facts "found in the BiOp" and that decision,  
28 establishes that the FWS must make findings on all four  
RPA requirements on the face of the BiOp. This  
overstates the Ninth Circuit's holding. First,

1           *Southwest Center* says nothing about requiring findings  
2           on the face of the BiOp. The requisite findings were,  
3           unsurprisingly, in the BiOp in that case, because those  
4           findings concerning how each component of the final RPA  
5           would avoid jeopardy, were explicitly required by the  
6           Consultation Handbook. Consultation Handbook 4-41  
7           ("When a reasonable and prudent alternative consists of  
8           multiple activities, it is imperative that the opinion  
9           contain a thorough explanation of how each component of  
10          the alternative is essential to avoid jeopardy and/or  
11          adverse modification.") (emphasis added). Neither the  
12          Handbook, the ESA, nor any of its implementing  
13          regulations explicitly require that the BiOp contain an  
14          analysis of any of the other three RPA requirements.

15           Plaintiffs suggest the second sentence from the  
16           *Southwest Center* language delineates that findings are  
17           required for all four RPA requirements. Plaintiffs  
18           quote that sentence as authority to claim the "'FWS  
19           considered the relevant factors and reasonably found' []  
20           the Joint Consultation Regulations requirements were  
21           satisfied with respect to an RPA issued in a biological  
22           opinion for the Southwest Willow Flycatcher...." Doc.  
23           237 at 10. This is misleading, because the entire  
24           sentence makes clear that the only "findings" discussed  
25           in *Southwest Center* were findings concerning the  
26           capacity of the Flycatcher to survive in the short term  
27           while the RPA was being implemented. 143 F.3d at 523.  
28           *Southwest Center* only stands for the proposition that  
          FWS must justify its conclusion that the RPA would  
          prevent jeopardy and/or adverse modification in the  
          BiOp. See *Greenpeace*, 55 F. Supp. 2d at 1268 (finding  
          the jeopardy determination to be the "guiding standard"  
          for determination of RPAs). *Southwest Center* does not  
          create the discussion requirement Plaintiffs suggest.

*PCFFA II*, on which Plaintiffs also rely, is not  
          contrary. 426 F.3d 1082. There, the Ninth Circuit  
          overturned an RPA adopted for coho salmon because NMFS  
          failed to articulate the bases for its assumptions  
          underlying the RPA. *Id.* at 1090-95. The district  
          court concluded that the agency had "implicitly  
          considered" whether all three phases of the RPA would  
          ensure against jeopardy. *Id.* at 1091. The Ninth  
          Circuit emphasized that "it is a basic principle of  
          administrative law that the agency must articulate the  
          reason or reasons for its decision." *Id.*

1 The Ninth Circuit found "little substance to the  
2 discussions of Phases I and II" in the BiOp. *Id.* at  
3 1093. Although some language suggested that "the  
4 agency believed that the RPA would avoid jeopardy to  
5 the coho, this assertion alone is insufficient to  
6 sustain the BiOp and the RPA." *Id.* The Ninth Circuit  
7 refused to "take [the agency's] word that the species  
8 will be protected if its plans are followed." *Id.* As  
9 in *Southwest Center, PCFFA II* only discussed whether  
10 the RPA would avoid jeopardy, the analysis of which is  
11 explicitly required in the BiOp. Here, Plaintiffs seek  
12 to extend this logic to mandate that FWS include  
13 specific findings concerning the three other RPA  
14 requirements in the BiOp. *PCFFA II* does not require  
15 this.

16 Plaintiffs also cite *NRDC v. Kempthorne*, 506 F. Supp.  
17 2d 322 (E.D. Cal. 2007), which held that, although  
18 certain, potentially critical data was part of the  
19 administrative record, its significance, or lack  
20 thereof, was not discussed in the BiOp. *Id.* at 362-  
21 363. The government's post hoc reasoning was rejected,  
22 that, even if the data had been addressed in the BiOp,  
23 the ultimate opinion reached by the Service would not  
24 have been different. "Although a decision of less than  
25 ideal clarity may be upheld if the agency's path may  
26 reasonably be discerned, [a court] cannot infer an  
27 agency's reasoning from mere silence. Rather, an  
28 agency's action must be upheld, if at all, on the basis  
articulated by the agency itself." *Id.* at 366 (citing  
*PCFFA*, 426 F.3d at 1091). The district court further  
reasoned "[h]ad FWS examined the FMWT 2004 data in the  
BiOp, the weight it gave to that data would have been  
entitled to deference. The agency's silence cannot be  
afforded deference." *Kempthorne*, 506 F. Supp. 2d at  
366.

Plaintiffs argue that this language reflects a  
requirement that analysis of the data must be included  
in the BiOp, suggesting that if such analysis was  
instead found elsewhere in the administrative record it  
would be insufficient. This reads too much into  
*Kempthorne*, where the necessary reasoning was found in  
neither the BiOp nor the administrative record. *Id.* at  
380 (district court searched for, but did not find,  
certain analyses in the BiOp or "elsewhere in the  
administrative record). *Kempthorne* found the content of  
the BiOp lacking in light of the entire AR, both of

1 which entirely failed to competently perform the  
2 required ESA jeopardy and habitat modification  
3 analyses. The practical fact is that a BiOp is much  
4 more accessible than the administrative record, which  
can be tens of thousands of pages long. *Kempthorne* did  
not address or decide the issue presented here.

5 In APA review cases, it is well established that, in  
6 determining whether agency action was "arbitrary,  
7 capricious, an abuse of discretion, or otherwise not in  
8 accordance with law... the court shall review the  
9 whole record or those parts of it cited by a party, and  
10 due account shall be taken of the rule of prejudicial  
11 error." 5 U.S.C. § 706. The "whole record," includes  
12 "everything that was before the agency pertaining to  
13 the merits of its decision." *Portland Audubon Soc'y v.*  
*Endangered Species Committee*, 984 F.2d 1534, 1548 (9th  
Cir. 1993). See also *Seattle Audubon Soc'y v. Lyons*,  
871 F. Supp. 1291, 1308 (W.D. Wash. 1994) (finding  
14 declarations properly considered to "explain the  
15 agency's actions or to determine whether its course of  
16 inquiry was inadequate.").

17 DWR's cases do not undermine this reasoning. *Motor*  
*Vehicle Manufacturers Association of the United States,*  
*Inc., v. State Farm Mutual Auto Insurance Company*, 463  
18 U.S. 29 (1983), concerned the National Highway Traffic  
19 Safety Administration's ("NHTSA") decision to rescind  
20 passive restraint crash safety requirements for new  
21 motor vehicles. When NHTSA learned that automakers  
22 opted to install automatic seatbelts which users could  
23 easily detach, the agency rescinded the order in light  
24 of the expense required to implement a program that  
25 would have only minimal safety benefits because it  
could be disengaged by users. *Id.* at 38-39. The Court  
concluded that this decision was arbitrary and  
capricious because NHTSA failed to consider modifying  
the standard to require the installation of airbags.  
*Id.* at 46. In reaching this conclusion, the Court  
indicated it must "consider whether the decision was  
based on a consideration of the relevant factors and  
whether there has been a clear error of judgment." *Id.*  
(emphasis added).

26 Focusing on *State Farm's* use of the word "decision,"  
27 DWR asserts that all relevant factors must be  
28 considered in the text of the agency's decision  
document, rather than elsewhere in the administrative

1 record. But, *State Farm* also emphasized that the  
2 relevant statute required a "record of the rulemaking  
3 proceedings to be compiled," *id.* at 43-44, and  
4 indicated that "Congress established a presumption  
5 against... changes in current policy that are not  
6 justified by the rulemaking record," *id.* at 43. *State  
Farm* does not support DWR's position that the "whole  
7 record" rule should be ignored in favor of a  
8 requirement that any and all analytical reasoning must  
9 be included in the decision document (the BiOp).

10 DWR also relies on *Burlington Truck Lines, Inc. v.  
11 United States*, 371 U.S. 156, 168-69 (1962), which  
12 criticized the Interstate Commerce Commission's ("ICC")  
13 failure to make any findings or include any analysis to  
14 justify a particular decision. The Court noted that  
15 "expert discretion is the lifeblood of the  
16 administrative process, but unless we make the  
17 requirements for administrative action strict and  
18 demanding, expertise, the strength of modern  
19 government, can become a monster which rules with no  
20 practical limits on its discretion." *Id.* at 167  
21 (internal citations and quotations omitted). See also  
22 *Ry. Labor Executives' Ass'n v. ICC*, 784 F.2d 959, 974  
23 (refusing to "rummage around in the record below to  
24 find a plausible rationale to fill the void in the  
25 agency order under review"). *Burlington and Railway  
26 Labor Executives'* insistence upon formal findings is  
27 unsurprising given that, under the procedures  
28 applicable in that case, where the ICC was required to  
"make findings that support its decision, and those  
findings must be supported by substantial evidence."  
*Id.* No such general findings requirement exists here.  
Rather, the only findings explicitly required by the  
Consultation Handbook are those concerning the capacity  
of any RPA to prevent jeopardy and/or adverse  
modification.

A statute or regulation may specifically require  
certain reasoning or findings to be included in the  
ultimate decision document. The above-mentioned  
requirement that the BiOp explain why each part of a  
multi-part RPA ensures against jeopardy or adverse  
modification is one such example. However, there is no  
parallel requirement that FWS certify or make findings  
with respect to the other three RPA requirements on the  
fac[e] of the record. It is not appropriate for a  
court to "create[] a requirement not found in any

1 relevant statute or regulation." *The Lands Council v.*  
2 *McNair*, 537 F.3d 981, 991 (9th Cir. 2008). Rather, the  
3 issue of whether FWS properly promulgated the RPA must  
be decided on the basis of the entire record.

4 Doc. 354 at 38-51 (footnotes omitted, emphasis in original).

5 Plaintiffs' argument that the three non-jeopardy factors must be  
6 explicitly analyzed on the face of the BiOp was rejected, but the  
7 question of how the three non-jeopardy factors must be treated  
8 elsewhere in the record was left open. Must an explicit analysis  
9 of the three factors be included in the record? Or may evidence  
10 in the record itself, even absent explicit analysis, be relied  
11 upon to evaluate whether the RPA satisfies the three factors?  
12

13 The October 15, 2009 Decision recognizes a dichotomy in the  
14 caselaw:

15 On the one hand, an agency action may be upheld even if  
16 it is of "less than ideal clarity" as long as "the  
17 agency's path may reasonably be discerned." *Bowman*  
*Transp., Inc. v. Arkansas-Best Freight System, Inc.*,  
18 419 U.S. 281, 285-86 (1974). However, a court "cannot  
19 infer an agency's reasoning from mere silence..." but  
20 must "rely only on what the agency actually said...."  
*Compare Gifford Pinchot Task Force v. U.S. Fish and*  
*Wildlife Serv.*, 378 F.3d 1059, 1072 n.9 (9th Cir. 2004)  
21 (holding that the court "may only rely on what the  
22 agency said in the record to determine what the agency  
23 decided and why"); *Pac. Coast Fed'n of Fishermen's*  
*Ass'ns v. NMFS*, 426 F.3d 1082, 1092 (9th Cir. 2005)  
24 ("PCFFA II") (citing *Gifford Pinchot* for the  
proposition that a court must "rely only on what the  
agency actually said in the biological opinion").

25 *Id.* at 39.

26 Defendants acknowledge that the agency must explicitly  
27 analyze the jeopardy factor, but claim that it is permissible for  
28

1 the agency not to address the non-jeopardy factors anywhere in  
2 the administrative record. To accept Defendants' view would be  
3 to abdicate the judicial review function. Even though the  
4 jeopardy factor is the "guiding standard" for the adoption of an  
5 RPA, *see Greenpeace*, 55 F. Supp. 2d at 1268, this does not  
6 eviscerate the other three § 402.02 factors. *Greenpeace* rejected  
7 the contention that the "economically and technologically  
8 feasible" language required the agency to "balance the benefit to  
9 the species against the economic and technical burden on the  
10 industry before approving an RPA," because such a conclusion  
11 would be inconsistent with the purposes of the ESA under *TVA v*  
12 *Hill*. *Id.* *Greenpeace* confirms that 50 C.F.R. § 402.02 "contains  
13 four distinct requirements for any valid RPA," *id.* at 1264, and  
14 that FWS "must come up with [RPAs] that are consistent with the  
15 purposes of the underlying action and the action agency's  
16 authority, that are economically and technologically feasible,  
17 and which avoid the likelihood of jeopardy and adverse  
18 modification." *Id.*

19  
20  
21 According to *PCFFA*, a court should "sustain an agency action  
22 if the agency has articulated a rational connection between the  
23 facts found and the conclusions made." 426 F.3d at 1090 (citing  
24 *Motor Vehicle Mfrs. Ass'n*, 463 U.S. at 43).

25  
26 "Even when an agency explains its decision with 'less  
27 than ideal clarity,' a reviewing court will not upset  
28 the decision on that account 'if the agency's path may  
reasonably be discerned.'" *Alaska Dep't of Env't'l*



1           *Conserv. v. EPA*, 540 U.S. 461, 497 (2004) (quoting  
2           *Bowman Transp., Inc. v. Arkansas-Best Freight Sys.,*  
3           *Inc.*, 419 U.S. 281, 286 (1974))

4           While our review is deferential, our inquiry must "be  
5           searching and careful." *Marsh*, 490 U.S. at 378. We  
6           must determine whether the agency's decision was "based  
7           on a consideration of the relevant factors and whether  
8           there has been a clear error of judgment." *Id.*

9           *Id.* Here, the agency has articulated absolutely no connection  
10          between the facts in the record and the required conclusion that  
11          the RPA is (1) consistent with the purpose of the underlying  
12          action; (2) consistent with the action agency's authority; and  
13          (3) economically and technologically feasible. The record here  
14          is not just an explanation of "less than ideal clarity." There  
15          is no explanation at all

16          Defendants offer a number of post hoc rationalizations for  
17          the RPA. Defendant-Intervenors argue that the record  
18          demonstrates the RPA can be implemented in a manner consisted  
19          "with the intended purpose of the action" and "within the scope  
20          of the Federal agency's legal authority and jurisdiction,"  
21          because, by letter dated December 15, 2008, the Bureau  
22          "provisionally accept[ed]" most portions of the RPA and stated  
23          that Components 3 and 4 "both need additional review and  
24          refinement before Reclamation will be able to determine whether  
25          implementation of these actions by the Projects is reasonable and  
26          prudent." *NRDC v. Kempthorne*, 1:05-cv-01207 OWW GSA, Doc. 767-1.  
27          Defendant-Intervenors conclude that the Bureau has made no  
28

1 determination that the RPA is inconsistent with the purpose of  
 2 the action or with its legal authority and jurisdiction. Doc.  
 3 661-3 at 38. They suggest as to economic and technological  
 4 feasibility, that these requirements must have been considered  
 5 because, based on concerns expressed by the Bureau, the RPA was  
 6 modified to be more flexible.<sup>46</sup> *Id.* at 37.

8 But, the record provides none of these explanations.<sup>47</sup> FWS  
 9 is ultimately responsible to ensure that the record supports the  
 10 RPA. FWS explained in the preamble to its final rule adopting the  
 11 Joint Consultation Regulations:

12 [I]n those instances where the Service disagrees with a  
 13 Federal agency's assessment of the reasonableness of  
 14 its alternatives, the Service must reserve the right to  
 15 include those alternatives in the biological opinion if  
 it determines that they are "reasonable and prudent"  
 according to the standards set out in the definition in

---

16  
 17 <sup>46</sup> For example, OMR flows under Components 1 and 2 are to be calculated  
 18 based on a 14-day running average, compared to the 7-day average under the  
 interim remedial order. See BiOp at 168, 280-82. The turbidity trigger for  
 19 Action 1 of Component 1 is now based on a 3-day average at three stations in  
 the Delta, compared to one station under the Court's interim remedial order,  
 to "better reflect a Delta-wide change in turbidity than one station which may  
 be prone to localized conditions." BiOp at 281, 347.

20 <sup>47</sup> The specific requirements of the X2 action are another example of how  
 21 the record fails to address the "consistency with the intended purpose of the  
 action," and is "within the scope of the ... agency's authority and  
 22 jurisdiction." 50 C.F.R. § 402.02. Because of competing demands for water  
 from the Projects, combined with a limited supply, one purpose of the Projects  
 23 is to ensure that that water use and allocation be carefully managed, and to  
 also ensure that water is put to a beneficial use and not wasted. This  
 24 purpose is, in fact, required by California law, Cal. Const. art. X, § 2; Cal.  
 Water Code § 275, and imposed upon federal project operations by virtue of  
 Section 8 of the Reclamation act of 1902. 43 U.S.C. § 383. The Projects  
 25 will have to expend hundreds of thousands of acre feet of water to maintain X2  
 as far seaward as Component 3 requires. Miller Decl., Doc. 400, at ¶¶ 67-73.  
 26 Less water would be required if X2 did not need to be pushed so far  
 downstream—water would then be available for other uses. Yet nothing in the  
 27 BiOp or the record explains why it is essential that X2 be moved seaward to  
 the degree required by Component 3 in order to protect the smelt and its  
 28 habitat.

1 § 402.02; the Service cannot abdicate its ultimate duty  
2 to formulate these alternatives by giving Federal  
3 agencies control over the content of a biological  
4 opinion.

5 51 Fed. Reg. 19,926, 19,952 (June 3, 1986). Even if, *arguendo*,  
6 the RPA is consistent with the multiple purposes of the action  
7 and the agency's statutory authority, and is economically and  
8 technologically feasible to implement, the APA requires, and the  
9 public is entitled under the law to receive, some exposition in  
10 the record of why the agency concluded (if it did so at all) that  
11 all four regulatory requirements for a valid RPA were satisfied.  
12 The RPA Actions manifestly interdict the water supply for  
13 domestic human consumption and agricultural use for over twenty  
14 million people who depend on the Projects for their water supply.  
15 "Trust us" is not acceptable. FWS has shown no inclination to  
16 fully and honestly address water supply needs beyond the species,  
17 despite the fact that its own regulation requires such  
18 consideration.

19 How the appropriation of water for the RPA Actions, to the  
20 exclusion of implementing less harmful alternatives, is required  
21 for species survival is not explained. The appropriate remedy  
22 for such a failure to explain is remand to the agency. See *Sears*  
23 *Sav. Bank v. Federal Sav. and Loan Ins. Corp.* 775 F.2d 1028,  
24 1030 (9th Cir. 1985) ("If the administrative record is inadequate  
25 to explain the action taken, the preferred practice is to remand  
26 to the agency for amplification."). Plaintiffs' motion for  
27  
28

1 summary judgment that FWS violated § 402.02 is GRANTED;  
2 Defendants' cross-motion is DENIED.

3  
4 c. There is no Procedural Requirement that FWS  
5 Accept, Consider, and/or Address Comments  
6 Regarding the BiOp or its RPA.

7 Neither the ESA nor its implementing regulations require an  
8 opportunity for public comment or that FWS respond to any  
9 comments received. See *Kandra v. United States*, 145 F. Supp. 2d  
10 1192, 1209 n.8 (D. Or. 2001) ("as the government correctly  
11 pointed out during oral argument, the ESA does not require public  
12 review or input during the consultation process"); *Ctr. for*  
13 *Biological Diversity v. Kempthorne*, 2008 WL 659822, \*7 (D. Ariz.  
14 Mar. 6, 2008) ("Biological opinions, unlike DPS findings, are not  
15 subject to notice and comment rulemaking procedures pursuant to  
16 the ESA."). Plaintiffs' suggestion that FWS violated the ESA by  
17 "ignoring" comments on the draft BiOp is legally unsustainable.  
18 Plaintiffs' motion on this ground is DENIED; Defendants' cross-  
19 motion is GRANTED.

20  
21 C. Stewart & Jasper Orchards' Argument Re: Reasonable and  
22 Prudent Measures.

23 Stewart & Jasper Orchards, et al., ("Stewart & Jasper")  
24 allege that FWS's failure to consider the economic impacts of  
25 implementing the reasonable and prudent measures ("RPMs") is  
26 arbitrary and capricious. Doc. 551 at 68 n. 24. Whenever FWS  
27 offers reasonable and prudent alternatives to avoid jeopardy to a  
28

1 species, it must also specify "those reasonable and prudent  
2 measures that [FWS] considers necessary or appropriate to  
3 minimize" incidental taking of the species. 16 U.S.C. §  
4 1536(b)(4)(C)(ii). Stewart & Jasper argues that by formulating  
5 RPMs that it believes "are necessary and appropriate to minimize  
6 the effect of the proposed action on the delta smelt," without  
7 "provid[ing] a statement that allows for Reclamation to take into  
8 consideration the economic impacts of implementing the RPMs," see  
9 BiOp at 294, FWS has allegedly "arbitrarily left open the  
10 question of whether the RPMs are in fact reasonable, necessary,  
11 and appropriate in light of the harm that their implementation  
12 will cause." Doc. 551 at 68 n. 24.

13  
14 This argument is unsupported in law. Unlike 50 C.F.R. §  
15 402.02's definition of a RPA, which provides that RPAs must be  
16 "economically and technologically" feasible, the regulatory  
17 definition of RPM lacks such language:  
18

19 Reasonable and prudent measures refer to those actions  
20 the Director believes necessary or appropriate to  
21 minimize the impacts, i.e., amount or extent, of  
22 incidental take.

23 50 C.F.R. § 402.02. Even if the definition of RPM included an  
24 economic feasibility requirement, this language does not require  
25 that FWS "balance the benefit to the species against the economic  
26 and technical burden on the industry before approving an RPA,"  
27 because such a conclusion is inconsistent with the purposes of  
28 the ESA under *TVA v Hill*. *Greenpeace*, 55 F. Supp. 2d at 1267.

1 Stewart & Jasper's motion for summary judgment regarding the  
2 lawfulness of the RPMs for failure to consider economic effects  
3 is DENIED; Federal Defendants and Defendant-Intervenors' cross-  
4 motions are GRANTED.

5  
6 D. Stewart & Jasper, et al.'s, Argument that FWS Illegally  
7 Arrogated Authority to Itself Over Bureau of Reclamation and  
8 California Department of Water Resources Operations.

9 The Stewart & Jasper Plaintiffs raise a novel argument that  
10 FWS "illegally arrogated" authority to itself over Reclamation  
11 and DWR, by "claim[ing] the ability to oversee [Project  
12 operations] indefinitely," rather than "advis[ing] Reclamation  
13 and DWR on how to avoid jeopardizing the delta smelt and  
14 destroying or adversely modifying its critical habitat." Doc.  
15 551 at 80:

16 In RPA Component 1, for example, FWS not only set forth  
17 actions "designed to reduce the delta smelt entrainment  
18 losses," but also stated that "[t]hroughout the  
19 implementation of RPA Component 1, FWS will make the  
20 final determination as to OMR flows required to protect  
21 delta smelt." BiOp at 280-81. Likewise, in RPA  
22 Component 2 that FWS "shall make the final  
23 determination regarding specific OMR flows," BiOp at  
24 282, as well as the FWS' reasonable and prudent  
25 measures. See BiOp at 294 (noting that FWS "shall have  
26 the final decision on the operations of the Permanent  
27 Gates" and that the members of the Gate Operations  
28 Review Team "can provide suggestions to operate the  
gates, but the ultimate decision on how to operate the  
gates to protect delta smelt will be made by the  
Service").

26 *Id.*

27 Stewart & Jasper argue that this is unlawful because the ESA  
28 "does not give the FWS the power to order other agencies to

1 comply with their requests or to veto their decisions." *Id.*  
2 (citing *Sierra Club v. Marsh*, 816 F.2d 1376, 1386 (9th Cir.  
3 1987)). The law is clear that FWS has no such authority, nor can  
4 FWS, as consulting agency, act *ultra vires* to usurp the  
5 operational authority of the Bureau and DWR over the Projects.  
6 The November 13, 2009 Decision found: "the action agency retains  
7 the ultimate responsibility for deciding whether, and how, to  
8 proceed with the proposed action after Section 7 consultation."  
9 Doc. 399, Mem. Decision re Cross-Motions for Summary Judgment on  
10 NEPA Issues, at 23-24 n.7. Even if FWS issues an RPA with  
11 specific requirements following a jeopardy or adverse  
12 modification finding, the action agency remains free to disregard  
13 such requirements, and FWS has no enforcement authority absent an  
14 ESA violation. Reclamation and DWR have provisionally adopted  
15 the RPA and have implemented many of its Actions, but the record  
16 does not show FWS employees have "claimed the ability to oversee  
17 these agencies indefinitely." Doc. 551 at 80.

20 Stewart & Jasper's contention that FWS's reserved to itself  
21 "an ongoing power of oversight, as well as a power to dictate new  
22 and different pumping restrictions," assumes that neither  
23 Reclamation, as action agency, nor DWR, as co-operator, have the  
24 ability to not comply with the RPA. Doc. 697 at 87. Reclamation  
25 is not legally compelled to blindly follow FWS's pronouncements.  
26 Reclamation retains the authority to reject the RPA at any time,  
27  
28

1 subject to its obligation to reinitiate consultation. Although  
2 FWS has not yet demonstrated a willingness or capability to  
3 protect interests other than the species, it cannot be assumed  
4 that Reclamation will not lawfully discharge its statutory water  
5 supply responsibilities.

6  
7 Stewart & Jasper's motion for summary judgment regarding  
8 FWS's alleged unlawful arrogation of authority is DENIED; Federal  
9 Defendants and Defendant-Intervenors' cross-motions are GRANTED.

10  
11 E. Information Quality Act Claim.

12 Family Farm Alliance ("FFA") Plaintiffs claim that Federal  
13 Defendants did not apply the IQA and its implementing guidelines  
14 in preparing and disseminating the BiOp.

15  
16 (1) Legal Framework of the IQA.

17 The IQA provides in its entirety:

18 (a) IN GENERAL.--The Director of the Office of  
19 Management and Budget shall, by not later than  
20 September 30, 2001, and with public and Federal agency  
21 involvement, issue guidelines under sections 3504(d)(1)  
22 and 3516 of title 44, United States Code, that provide  
23 policy and procedural guidance to Federal agencies for  
24 ensuring and maximizing the quality, objectivity,  
utility, and integrity of information (including  
statistical information) disseminated by Federal  
agencies in fulfillment of the purposes and provisions  
of chapter 35 of title 44, United States Code, commonly  
referred to as the Paperwork Reduction Act.

25 (b) CONTENT OF GUIDELINES.--The guidelines under  
26 subsection (a) shall--

27 (1) apply to the sharing by Federal agencies of,  
28 and access to, information disseminated by Federal



1 agencies; and

2 (2) require that each Federal agency to which the  
3 guidelines apply--

4 (A) issue guidelines ensuring and maximizing  
5 the quality, objectivity, utility, and  
6 integrity of information (including  
7 statistical information) disseminated by the  
8 agency, by not later than 1 year after the  
9 date of issuance of the guidelines under  
10 subsection (a);

11 (B) establish administrative mechanisms  
12 allowing affected persons to seek and obtain  
13 correction of information maintained and  
14 disseminated by the agency that does not  
15 comply with the guidelines issued under  
16 subsection (a); and

17 (C) report periodically to the Director--

18 (i) the number and nature of complaints  
19 received by the agency regarding the  
20 accuracy of information disseminated by  
21 the agency; and

22 (ii) how such complaints were handled by  
23 the agency.

24 Pub. L. 106-554, 114 Stat 2763, 2763A-153-2763A-154 (2000)

25 (codified at 44 U.S.C. § 3516).

26 Subsection (a) mandates that the Office of Management and  
27 Budget ("OMB") issue, by no later than September 30, 2001,  
28 government-wide guidelines to ensure the "quality, objectivity,  
utility, and integrity of information" disseminated by federal  
agencies. See Pub. L. No. 106-554, § 515(a) (2000). The statute  
itself contains no substantive provisions regarding information  
quality, leaving the structure and design of any such

1 requirements to OMB. There is no relevant legislative history  
2 disclosing substantive Congressional intent regarding information  
3 quality.

4 Within one year of OMB's issuance of Guidelines, each  
5 federal agency was required to issue its own guidelines  
6 consistent with OMB's. *Id.* at § 515(b)(2)(A). OMB, the  
7 Department of the Interior, and FWS timely issued the required  
8 guidelines. See, e.g., Guidelines for Ensuring and Maximizing  
9 the Quality, Objectivity, Utility, and Integrity of Information  
10 Disseminated by Federal Agencies, 67 Fed. Reg. 8,452 (Feb. 22,  
11 2002) ("OMB IQA Guidelines"); Information Quality Guidelines of  
12 the U.S. Department of the Interior, 67 Fed. Reg. 50,687 (Aug. 5,  
13 2002)) ("DOI IQA Guidelines"); FWS Information Quality Guidelines  
14 ("FWS IQA Guidelines")<sup>48</sup>. The IQA specifically required agencies  
15 to "establish administrative mechanisms allowing affected persons  
16 to seek and obtain correction of information maintained and  
17 disseminated by the agency...." and to "report periodically" on  
18 "the number and nature of complaints received by the agency  
19 regarding the accuracy of information disseminated by the agency"  
20 and "how such complaints were handled by the agency." *Id.* at §  
21 515(b)(2)(B) & (C) (emphasis added).  
22  
23  
24

25 FWS's own IQA Guidelines are specific to its activities and  
26 disseminations, including biological opinions, and state that in

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27  
28 <sup>48</sup> Available at <http://www.fws.gov/informationquality/topics/IQAguidelines-final82307.pdf> (last visited August 11, 2010).

1 order to ensure objectivity of information disseminated, the  
2 information will be presented in an "accurate[]," "clear[],"  
3 "complete[]," and "unbiased" manner. FWS IQA Guidelines III-8.  
4 In addition, FWS' IQA Guidelines require that a "preparer of a  
5 highly influential assessment or of influential information ...  
6 document the strengths and weaknesses of the data underlying the  
7 assessment/information so that the reader will understand the  
8 context for the FWS decision." *Id.* at § VI-10.

9  
10 Plaintiffs maintain that FWS failed to comply with these  
11 guidelines because the "effects of the BiOp were assumed, not  
12 supported by data and objective and scientific analyses." Doc.  
13 551 at 82.

14  
15 (2) Right to Judicial Review Under the APA.

16 Federal Defendants and Defendant Intervenors raise a  
17 threshold objection, arguing that there is no right of judicial  
18 review under the IQA.

19 It is undisputed that the IQA provides no private right of  
20 action. A party challenging an administrative agency's  
21 compliance with a substantive statute that lacks an internal  
22 private right of action must seek judicial review under the APA.  
23 *See Lujan v. Nat'l Wildlife Fed'n*, 497 U.S. 871, 882 (1990);  
24 *Village of False Pass v. Clark*, 733 F.2d 605, 609 (9th Cir. 1984)  
25 (because ESA contains no internal standard of review, APA § 706  
26 governs review of actions brought under the ESA).  
27  
28

1           The APA authorizes suit by a plaintiff "suffering legal  
2 wrong because of agency action, or adversely affected or  
3 aggrieved by agency action within the meaning of a relevant  
4 statute." 5 U.S.C. § 702. There is a presumption of  
5 reviewability under the APA. *Shalala v. Illinois Council on Long*  
6 *Term Care, Inc.*, 529 U.S. 1, 44 n.11 (2000). However, the APA  
7 expressly precludes judicial review where: (1) any statute  
8 "precludes judicial review"; or (2) "agency action is committed  
9 to agency discretion by law." 5 U.S.C. § 701(a). If either of  
10 these exceptions applies, the lawsuit cannot proceed under the  
11 APA.  
12

13           If neither exception applies, the APA permits judicial  
14 review of "[a]gency action made reviewable by statute and final  
15 agency action for which there is no other adequate remedy in a  
16 court...." 5 U.S.C. § 704. Where a statute lacks an internal  
17 judicial review provision, the "agency action made reviewable by  
18 statute" language is inapplicable, requiring the existence of a  
19 "final agency action." "Agency action" is defined to include  
20 "the whole or a part of an agency rule, order, license, sanction,  
21 relief, or the equivalent or denial thereof, or failure to act."  
22 5 U.S.C. § 551(13). The APA requires that the agency action be  
23 upheld unless it is found to be "arbitrary, capricious, an abuse  
24 of discretion, or otherwise not in accordance with law," or  
25 "without observance of procedure required by law." 5 U.S.C. §  
26  
27  
28

1 706(2) .

2  
3 a. APA § 702(a)(2)'s Exception for Agency Action  
4 "Committed to Agency Discretion by Law" Bars  
5 Judicial Review in this Case.

6 FFA does not allege that any statute expressly precludes  
7 judicial review of FFA's IQA claim. The issue is whether the IQA  
8 and/or its implementing guidelines, by law, commit to agency  
9 discretion the disputed agency actions challenged by Plaintiff's  
10 claim.

11 The general test for when an action is "committed to agency  
12 discretion by law" under the APA is whether there is "no law to  
13 apply." *Heckler v. Chaney*, 470 U.S. 821, 830 (1985) (internal  
14 quotation marks omitted). "Agency action is committed to the  
15 discretion of the agency by law when 'the statute is drawn so  
16 that a court would have no meaningful standard against which to  
17 judge the agency's exercise of discretion.'" *Steenholdt v. FAA*,  
18 314 F.3d 633, 638 (D.C. Cir. 2003) (quoting *Heckler*, 470 U.S. at  
19 830). "If no 'judicially manageable standard' exists by which to  
20 judge the agency's action, meaningful judicial review is  
21 impossible and the courts are without jurisdiction to review that  
22 action." *Id.* Here, the IQA itself contains absolutely no  
23 substantive standards, let alone any standards relevant to the  
24 claims brought in this case concerning the timing of responses to  
25 Requests and Appeals and the makeup of peer review panels. The  
26 statute itself commits the challenged agency actions to the  
27  
28

1 agency's discretion.

2           However, even "[w]here an action is committed to absolute  
3 agency discretion by law, ... courts have assumed the power to  
4 review allegations that an agency exceeded its legal authority,  
5 acted unconstitutionally, or failed to follow its own  
6 regulations." *United States v. Carpenter*, 526 F.3d 1237, 1242  
7 (9th Cir. 2008); see also *Padula v. Webster*, 822 F.2d 97, 100  
8 (9th Cir. 1987) ("Judicially manageable standards may be found in  
9 formal and informal policy statements and regulations as well as  
10 in statutes, but if a court examines all these possible sources  
11 and concludes that there is, in fact, 'no law to apply,' judicial  
12 review will be precluded.") (quoting *Citizens to Preserve Overton*  
13 *Park, Inc. v. Volpe*, 401 U.S. 402, 410 (1971)). The critical  
14 issue is: Do the agency's own regulations create meaningful  
15 standards or do they preserve the discretion afforded by the  
16 statute?  
17  
18

19           *Salt Institute v. Thompson*, 345 F. Supp. 2d 589 (E.D. Va.  
20 2004), aff'd sub nom. on alternate grounds, *Salt Inst. v.*  
21 *Leavitt*, 440 F.3d 156 (4th Cir. 2006), applied 701(a)(2) and  
22 *Steenholdt* to the IQA, finding that "[n]either the IQA nor the  
23 OMB Guidelines provide judicially manageable standards that would  
24 allow meaningful judicial review to determine whether an agency  
25 properly exercised its discretion in deciding a request to  
26 correct a prior communication." With respect to the request for  
27  
28

1 correction at issue in *Salt Institute*:

2 [T]he guidelines provide that "[a]gencies, in making  
3 their determination of whether or not to correct  
4 information, may reject claims made in bad faith or  
5 without justification, and are required to undertake  
6 only the degree of correction that they conclude is  
7 appropriate for the nature and timeliness of the  
8 information involved." 67 Fed. Reg. at 8458. Courts  
9 have determined that regulations containing similar  
10 language granted sufficient discretion to agencies to  
11 preclude judicial review under the APA. See  
12 *Steenholdt*, 314 F.3d at 638 (holding that agency's  
13 decision under a regulation allowing an agency to take  
14 an action "for any reason the Administration considers  
15 appropriate" is committed to agency discretion and not  
16 reviewable under APA). Judicial review of [the  
17 agency's] discretionary decisions is not available  
18 under the APA because the IQA and OMB guidelines at  
19 issue insulate the agency's determinations of when  
20 correction of information contained in informal agency  
21 statements is warranted.

22 *Id.* at 602-603. Do the IQA Guidelines create meaningful  
23 standards regarding the content of a biological opinion, or do  
24 the Guidelines preserve agency discretion over these procedural  
25 matters?<sup>49</sup>

26 Plaintiffs' attempt to distinguish *Salt Institute* on the  
27 ground that, in preparing and disseminating "highly influential"  
28

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29 <sup>49</sup> Plaintiffs attempt to distinguish the many cases that have found no  
30 right to judicial review under the IQA on the ground none of them involved  
31 "final agency action" cognizable under the APA, which provides for judicial  
32 review of a "final agency action for which there is no other adequate remedy  
33 in a court ...." 5 U.S.C. § 704. Plaintiffs are correct that the relevant  
34 cases do not concern "final agency actions," for purposes of the APA. For  
35 example, *Salt Institute* involved the issuance of information about a trial  
36 study, an action the district court found was not "a final agency action  
37 necessary for judicial review under the APA." 345 F. Supp. 2d at 602. Here,  
38 the issuance of the BiOp is indisputably final agency action. However, "final  
39 agency action" is a necessary but not sufficient prerequisite to judicial  
40 review under the APA. Judicial review may also be precluded where there is no  
41 "judicially manageable standard" by which to judge the agency's action.  
42 *Heckler v. Chaney*, 470 U.S. at 830.

1 scientific documents, the agency is mandated to follow a  
2 scientific approach to develop the best available scientific data  
3 used in that document. Specifically, Plaintiffs reference FWS  
4 IQA Guidelines VI-10, which provide:

5 VI - 10 How will FWS describe the strengths and  
6 weaknesses of the data used in influential scientific  
7 information and highly influential scientific  
8 assessments?

9 The preparer of a highly influential assessment or of  
10 influential information will document the strengths and  
11 weaknesses of the data underlying the  
12 assessment/information so that the reader will  
13 understand the context for the FWS decision. The  
14 narrative will be contained in the administrative  
15 record of the issue under consideration. The  
16 documentation may be done in a narrative that includes  
17 a complete literature cited section, and an assessment  
18 of the strengths and weaknesses of the information used  
19 for advising the decision at hand. The narrative's form  
20 and length is left to the preparer. The following  
21 bullet points provide questions to consider in the  
22 narrative.

- 23 • What types of research studies does the  
24 assessment/information rely upon (e.g.  
25 experimental studies with controls,  
26 statistically designed observational studies  
27 that test hypotheses, monitoring studies,  
28 information synthesis, professional judgment  
etc.)?
- How recent is the research?
- What are the sources for the underlying data  
that support the assessment/information (e.g.  
peer reviewed article reporting primary data  
or data synthesis, unpublished peer reviewed  
reports, on-line publication, textbook,  
personal communication etc.)?
- Which of the sources were most crucial to the  
conclusions reached in the  
assessment/information?



- 1 • What type of review did each source receive  
2 (anonymous independent peer review, external  
3 peer review, agency review, public review and  
4 comment etc.)?
- 5 • Were the reviewers independent of the FWS?  
6 Were the reviewers independent of individuals  
7 or groups advocating a certain course of  
8 action by FWS?
- 9 • Were the reviews in compliance with OMB M-05-  
10 03, "Final Information Quality Bulletin for  
11 Peer Review"?

12 Two examples of how one might provide such a  
13 characterization are provided below:

14 Example 1: (A number of references are listed.)  
15 These references were the primary sources of data  
16 that provided the basis for the decision. They are  
17 peer reviewed studies with an experimental design  
18 that includes controls and testable hypotheses.  
19 They were completed within the last 5 years and  
20 were independently reviewed by non-FWS personnel  
21 and published in scientific journals.

22 Example 2: (A number of references are listed.)  
23 These references were articles and sources of data  
24 that provided specific data points that were  
25 included in the decision document, but by  
26 themselves did not primarily contribute to the  
27 decision. These citations are a combination of  
28 fact sheets, summaries of information,  
professional judgments, and personal  
communications that have not been peer reviewed.  
Most of the data is current (within the last 7  
years).

29 Although this biological opinion is undoubtedly the type of  
30 "influential document"<sup>50</sup> to which this provision applies,

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50 The FWS IQA Guidelines further state that the term "influential, when used in the phrase 'influential scientific, financial, or statistical information,' means that [FWS] can reasonably determine that dissemination of the information will have or does have a clear and substantial impact on

1 Plaintiffs' overreach by suggesting that these guidelines require  
2 the agency to follow any particular scientific approach to the  
3 development of the best available scientific data used in a BiOp.  
4 All that this guideline affirmatively requires is that the agency  
5 prepare some kind of "narrative" that documents the strengths and  
6 weaknesses of the data upon which the document relies. There are  
7 no other "judicially manageable standards" included in this  
8 guideline.  
9

10 Under this guideline provision, Plaintiffs have not claimed  
11 that no such narrative was prepared.<sup>51</sup> But, that is not the  
12 thrust of any of the IQA claims in this case, which seek to  
13 impose substantive standards on the presentation, use, and  
14 analysis of data by FWS. None of the guidelines cited by  
15 Plaintiffs set forth any "judicially manageable standards"  
16 against which the presentation, use, or analysis of data can be  
17 measured. The FWS guidelines disclaim any intent to do so or any  
18 right to judicial review. There is no right to judicial review  
19 of Plaintiffs' IQA claims. FFA's motion for summary judgment is  
20  
21

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22  
23 important public policy or private sector decisions, and thus, a decision or  
24 action to be taken by the Director.... As a general rule, FWS considers an  
25 impact clear and substantial when a specific piece of information or body of  
information is a principal basis for a FWS position." FWS IQA Guidelines, §  
III-10.

<sup>51</sup> Whether such a claim would be subject to judicial review is not clear.  
26 The guidelines specify that they are "intended only to improve the internal  
27 management of FWS relating to the [IQA]. Nothing in these guidelines is  
28 intended to create any right or benefit, substantive or procedural,  
enforceable by law or equity against the United States, its agencies, its  
offices, or another person. These guidelines do not provide, in any by  
themselves, any right to judicial review." FWS IQA Guidelines Part IV.

1 DENIED. Federal Defendants' cross motion is GRANTED.

2  
3 (3) To the Extent FFA Bases Any of its Claims against  
4 Reclamation on the ESA, Such Claims are Subject to the  
5 ESA's Pre-Filing Requirements.

6 To the extent FFA's IQA and ESA claims overlap, its ESA  
7 claims are subject to the ESA's pre-filing notice requirement.  
8 No suit may be commenced under the ESA "prior to sixty days after  
9 written notice of the violation has been given to the Secretary."  
10 16 U.S.C. § 1540(g)(2)(A)(i). This requirement is jurisdictional  
11 and "[a] failure to strictly comply with the notice requirement  
12 acts as an absolute bar to bringing suit under the ESA."  
13 *Southwest Ctr. for Biological Diversity*, 143 F.3d at 520.  
14 Failure to comply with a statutory notice requirement is a  
15 jurisdictional objection that may be addressed "at any time."  
16 See Fed. R. Civ. P. 12(h)(3).

17 Here, FFA failed to notify Reclamation of its intent to sue.  
18 Plaintiffs argue that "[a]doption of a BiOp is a final agency  
19 action, and such actions are subject to judicial review under the  
20 APA," citing *Bennett v. Spear*, 520 U.S. at 178. However,  
21 allowing a plaintiff to circumvent the ESA's 60-day notice  
22 requirement by claiming that its cause of action arises under the  
23 APA would circumvent the ESA's notice requirement entirely.  
24 *Hawaii County Green Party v. Clinton*, 124 F. Supp. 2d 1173, 1193  
25 (D. Haw. 2000).

26  
27 To the extent that FFA's claims against Reclamation arise  
28

1 under the ESA, their motion for summary judgment is DENIED on the  
2 ground that they failed to comply with the statutory notice  
3 requirement. Federal Defendants' and Defendant Intervenors'  
4 cross-motions are GRANTED.  
5

6 F. Renewed Claim That FWS Violated NEPA.

7 Plaintiffs attempt to revisit the issue of whether FWS  
8 violated NEPA in issuing the BiOp and its RPA. Plaintiffs first  
9 renew an argument that was rejected in the Salmonid Consolidated  
10 cases, namely that *Ramsey v. Cantor*, 96 F.3d 434 (9th Cir. 1996),  
11 the only case in which the issuance of a biological opinion was  
12 found to violate NEPA, controls here. In *Ramsey*, the NEPA  
13 obligation was imposed on the consulting agency's issuance of a  
14 biological opinion in part because there was no federal action  
15 agency to comply with NEPA.  
16

17 The November 12, 2009 NEPA decision in this case found  
18 *Ramsey* inapplicable because the action agency is Reclamation.  
19 See Doc. 399 at 16-17. Plaintiffs argue that the Courts' initial  
20 finding was incorrect because, here, as in *Ramsey*, the BiOp was  
21 not only imposed upon Reclamation's operations, but also upon the  
22 operations of DWR, a state agency. This argument was rejected  
23 in the Consolidated Salmonid Cases shortly after the cross-  
24 motions in the Consolidated Smelt Cases were filed. The March 5,  
25 2010 Consolidated Salmonid Cases decision concluded:  
26

27 Plaintiffs ignore the interconnected nature of the SWP  
28

1 and CVP projects. Reclamation and DWR have, for many  
2 years, operated the projects in a coordinated manner.  
3 See OCAP Biological Assessment ("OCAP BA") at 1-2. The  
4 Biological Assessment ("BA"), prepared by Reclamation,  
5 describes the project for which consultation was being  
6 sought as "the ongoing operations of the CVP and SWP  
7 and potential future actions that are foreseeable to  
8 occur within the period covered by the project  
9 description." *Id.* at 1-1. The two water projects,  
10 which are jointly operated by Reclamation and DWR,  
11 share water resources, storage, pumping, and conveyance  
12 facilities to manage and deliver one third of the water  
13 supply for the State of California. Reclamation's BA  
14 provided NMFS with extensive analyses of the effects of  
15 coordinated operation of the CVP and SWP on the Listed  
16 Species.

17 *Consolidated Salmonid Cases*, 1:09-cv-1053 OWW DLB, Doc. 266 at 14  
18 (emphasis in original). Plaintiffs offer no new law or  
19 persuasive authority compelling a finding of clear error to  
20 justify reconsideration.

21 Alternatively, Plaintiffs argue that "FWS's future choices  
22 with respect to OMR flows restrictions are 'major federal  
23 actions' within the scope of [NEPA's implementing regulations]."  
24 Doc. 551 at 87. This argument continues:

25 [R]ather than DWR or Reclamation operating the CVP and  
26 SWP, respectively, the BiOp and its RPA have resulted  
27 in transferring operational control to FWS for up to  
28 six months year (i.e., December through June). FWS'  
future choices with regard to implementation of RPA  
Components 1 and 2 will cause distinct and separate  
impacts to the human environment within both the CVP  
and SWP service areas. Even if Reclamation shares a  
NEPA obligation with regard to its acceptance of the  
BiOp, Reclamation is not the proper federal agency to  
account for and analyze the environmental effects of  
FWS' actions that will occur within the SWP service  
area. These SWP impacts are solely attributable to the  
FWS' formulation of the RPA and its ongoing role in  
implementing that RPA, and they were not caused by

1 Reclamation and are beyond Reclamation's discretion or  
2 jurisdiction. FWS will continue to make weekly water  
3 use and resource allocation decisions that amount to  
4 major federal actions significantly affecting the human  
5 environment in both CVP and SWP service areas without  
6 the benefit of the information required by a proper  
7 NEPA review and without satisfying the public  
8 disclosure and accountability purposes of NEPA.

9 *Id.*

10 This is an attempt to re-argue and re-frame arguments  
11 previously decided. The prior NEPA rulings determined that  
12 Reclamation bears the NEPA responsibility in this case as action  
13 agency. "Reclamation proposed the action (in the form of the  
14 Operations and Criteria Plan ('OCAP')) to FWS, which triggered  
15 the preparation of the BiOp." Doc. 399 at 28. "Reclamation was  
16 not 'bound' by the BiOp until it chose to proceed with the OCAP  
17 and implement the RPA. Once Reclamation did so, operation of the  
18 Projects became the relevant agency 'action,' and Reclamation, as  
19 action agency, is the more appropriate lead agency under NEPA."  
20 *Id.* at 30. Reclamation accepted the adaptive management protocol  
21 prescribed in the RPA "as a constraint upon its operations when  
22 it provisionally accepted the RPA." Doc. 399 at 30. FWS's day-  
23 to-day decisions to implement the adaptive management protocol  
24 are a natural incident of Reclamation's decision to adopt the  
25 RPA. Moreover, FWS's setting of specific OMR flows under RPA  
26 Components 1 and 2 is based on a weekly review of salvage data,  
27 distribution, flow and turbidity levels, population status, and  
28 other information, making NEPA review of such actions

1 impractical. See *Flint Ridge Dev. Co. v. Scenic Rivers Ass'n*,  
2 426 U.S. 776, 788-89 (1976) (provision in applicable law  
3 requiring statement of record to become effective 30 days after  
4 filing made preparation of EIS "inconceivable"); *Kandra*, 145 F.  
5 Supp. 2d at 1205 (finding that "[a]n EIS takes at least several  
6 months to complete"). FWS has no legal or functional authority  
7 to operate the projects and adequate remedies exist to compel the  
8 Bureau to stop FWS, if FWS endeavors to do so.

9  
10 Plaintiffs' motion for summary judgment as to FWS's  
11 liability under NEPA is DENIED; Federal Defendants' and  
12 Defendant-Intervenors' cross motion is GRANTED.

13  
14 G. Reclamation's Liability under the ESA.

15 Following the issuance of a biological opinion, the ESA  
16 regulations require the action agency, here, Reclamation, to  
17 "determine whether and in what manner to proceed with the action  
18 in light of its section 7 obligations and the Service's  
19 biological opinion." 50 C.F.R. § 402.15(a). In making that  
20 determination, a federal action agency "may not rely solely on a  
21 FWS biological opinion to establish conclusively its compliance  
22 with its substantive obligations under section 7(a)(2)." *Pyramid*  
23 *Lake Paiute Tribe of Indians v. U.S. Dept. of Navy*, 898 F.2d  
24 1410, 1415 (9th Cir. 1990). In *City of Tacoma v. Fed. Energy*  
25 *Regulatory Comm'n*, 460 F.3d 53, 76 (D.C. Cir. 2006), the D.C.  
26 Circuit summarized the caselaw culminating in *Pyramid Lake*:  
27  
28

1 [The] interagency consultation process reflects  
2 Congress's awareness that expert agencies (such as the  
3 [NMFS] and [FWS]) are far more knowledgeable than other  
4 federal agencies about the precise conditions that pose  
5 a threat to listed species, and that those expert  
6 agencies are in the best position to make discretionary  
7 factual determinations about whether a proposed agency  
8 action will create a problem for a listed species and  
9 what measures might be appropriate to protect the  
10 species. Congress's recognition of this expertise  
11 suggests that Congress intended the action agency to  
12 defer, at least to some extent, to the determinations  
13 of the consultant agency, a point the Supreme Court  
14 recognized in *Bennett v. Spear*, 520 U.S. 154, 169-170  
15 (1997). In *Bennett*, the Court stated that an action  
16 agency disregards a jeopardy finding in a BiOp "at its  
17 own peril" and bears the burden of articulating the  
18 reasons for reaching its contrary conclusion. *Id.*

12 Accordingly, when we are reviewing the decision of an  
13 action agency to rely on a BiOp, the focus of our  
14 review is quite different than when we are reviewing a  
15 BiOp directly. In the former case, the critical  
16 question is whether the action agency's reliance was  
17 arbitrary and capricious, not whether the BiOp itself  
18 is somehow flawed. *Aluminum Co. of Am. v. Adm'r,*  
19 *Bonneville Power Admin.*, 175 F.3d 1156, 1160 (9th  
20 Cir.1999); *Pyramid Lake Paiute Tribe v. U.S. Dep't of*  
21 *Navy*, 898 F.2d 1410, 1415 (9th Cir.1990); *Stop H-3*  
22 *Ass'n v. Dole*, 740 F.2d 1442, 1460 (9th Cir.1984); cf.  
23 *Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv.*,  
24 422 F.3d 782, 790 (9th Cir. 2005) (direct review of a  
25 BiOp). Of course, the two inquiries overlap to some  
26 extent, because reliance on a facially flawed BiOp  
27 would likely be arbitrary and capricious, but the  
28 action agency "need not undertake a separate,  
independent analysis" of the issues addressed in the  
BiOp. *Aluminum Co.*, 175 F.3d at 1161. In fact, if the  
law required the action agency to undertake an  
independent analysis, then the expertise of the  
consultant agency would be seriously undermined. Yet  
the action agency must not blindly adopt the  
conclusions of the consultant agency, citing that  
agency's expertise. *Id.* Rather, the ultimate  
responsibility for compliance with the ESA falls on the  
action agency. 16 U.S.C. § 1536(a) (1)-(2). In *Pyramid*  
*Lake*, the Ninth Circuit balanced these two somewhat  
inconsistent principles and articulated the following



1 rule:

2

3

4

5

6

7

[E]ven when the [consultant agency's] opinion is based on "admittedly weak" information, another agency's reliance on that opinion will satisfy its obligations under the Act if a challenging party can point to no "new" information- i.e., information the [consultant agency] did not take into account-which challenges the opinion's conclusions.

8

898 F.2d at 1415; see also *Defenders of Wildlife v. U.S. EPA*, 420 F.3d 946, 959, 976 (9th Cir. 2005); *Stop H-3 Ass'n*, 740 F.2d at 1459-60.

9

10

*City of Tacoma*, 460 F.3d at 75-76. The D.C. Circuit rejected the

11

*City of Tacoma's* claim that the consultant agency in that case,

12

FERC, was liable under the ESA because the City had not

13

"presented FERC with new information that was unavailable to

14

[NMFS] or [FWS] and that would give FERC a basis for doubting the

15

expert conclusions in the BiOps those agencies prepared." *Id.* at

16

76.

17

18

Here, Plaintiffs attempt to side-step this standard, arguing

19

that Reclamation should have independently recognized and

20

addressed specified errors in the BiOp. For example, they argue

21

Reclamation should have recognized the error caused by comparing

22

CALSIM data to non-CALSIM Data because Reclamation had

23

extensively analyzed the use of CALSIM in the BA. See AR 010698-

24

010807. The BA stated:

25

26

The simulation results of the OCAP BA are designed for a comparative evaluation because the CALSIM-II model uses generalized rules to operate the CVP and SWP systems and the results are a gross estimate that may

27

28

1 not reflect how actual operations would occur....  
2 Results should only be used as a comparative evaluation  
3 to reflect how changes in facilities and operations may  
affect the CVP-SWP system.

4 AR 010701. FWS took this information into account in the BiOp.  
5 See BiOp at 204-206, reviewing Calsim II modeling performed in  
6 the BA. Plaintiffs have not demonstrated that Reclamation was in  
7 possession of any "new information" not considered by FWS that  
8 provided Reclamation a basis for questioning the BiOp's expert  
9 conclusions. Absent such a showing, even though the BiOp is  
10 flawed in many ways, Reclamation could rely upon it without  
11 incurring ESA liability.  
12

13  
14 VIII. CONCLUSION

15 It cannot be disputed that the law entitles the delta smelt  
16 to ESA protection. It is significant that the co-operator of the  
17 Projects, DWR, in its endeavors to protect a substantial part of  
18 the State's water supply, opposes as unjustified and based on bad  
19 science some of the RPA Actions. It is equally significant that  
20 despite the harm visited on California water users, FWS has  
21 failed to provide lawful explanations for the apparent over-  
22 appropriation of project water supplies for species protection.  
23 In view of the legislative failure to provide the means to assure  
24 an adequate water supply for both the humans and the species  
25 dependent on the Delta, the public cannot afford sloppy science  
26 and uni-directional prescriptions that ignore California's water  
27 needs. A court is bound by the law. Resource allocation and  
28

1 establishing legislative priorities protecting the environment  
2 are the prerogatives of other branches of government. The law  
3 alone cannot afford protection to all the competing interests at  
4 stake in these cases.

5 For all the reasons set forth above:

6 (A) Plaintiffs' and DWR's motions for summary judgment that  
7 the BiOp violates the ESA and the APA are GRANTED IN PART  
8 AND DENIED IN PART; and Federal Defendants' and Defendant  
9 Intervenor's cross-motions are GRANTED IN PART AND DENIED IN  
10 PART based on the following findings:  
11

12 (1) It was not arbitrary, capricious, or clear error  
13 for FWS to base its jeopardy conclusion in part on  
14 Kimmerer (2008)'s predictions of relative increases in  
15 delta smelt entrainment.  
16

17 (2) FWS's failure to apply a quantitative life-cycle  
18 model to evaluate the impacts of Project operations on  
19 the smelt did not violate the ESA.

20 (3) The BiOp's reliance on analyses using raw salvage  
21 figures to set the upper and lower OMR flow limits of  
22 Actions 1, 2, and 3 was arbitrary and capricious and  
23 represents a failure to use the best available science.  
24 Actions 1, 2, and 3 depend so heavily on these flawed  
25 analyses that this failure is not harmless. Remand is  
26 necessary.  
27  
28

1 (4) Comparison of Calsim II to Dayflow model runs  
2 created potentially material bias in the BiOp's  
3 evaluation of the impacts of Project operations on the  
4 position of X2 and related conclusions regarding  
5 population dynamics and habitat. FWS's failure to  
6 address or explain this material bias represents a  
7 failure to consider and evaluate a relevant factor and  
8 violates the ESA and APA. Remand is required.

9  
10 (5) The use of Dayflow to represent the baseline did  
11 not improperly attribute past effects to the Projects.

12 (6) The flawed Calsim II to Dayflow comparison fatally  
13 taints the justification provided for Action 4. Remand  
14 is required.

15  
16 (7) Plaintiffs' argument that Action 4 is unlawful  
17 because it is an "untested hypothesis" is an unfounded  
18 interpretation of the scientific method.

19 (8) FWS's reliance on Feyrer (2007), Feyrer (2008), and  
20 Bennett (2005) was not arbitrary, capricious, or clear  
21 error.

22 (9) The best science available at the time the BiOp  
23 issued supports the conclusion that X2 is a valid  
24 surrogate for delta smelt habitat.

25  
26 (10) Plaintiffs' argument that FWS violated the best  
27 available science standard because the smelt are not  
28

1 habitat limited is unfounded. The BiOp admits the  
2 delta smelt may not be habitat limited, but reasonably  
3 concludes that the species has become increasingly  
4 habitat limited over time, contributing to the  
5 population's decline, and that worsening habitat  
6 conditions may limit smelt recovery.  
7

8 (11) FWS's use of a linear stock-recruit model,  
9 although scientifically criticized, was not arbitrary,  
10 capricious, or clear error.

11 (12) The BiOp has failed to sufficiently explain why  
12 maintaining X2 at 74 km (following wet years) and 81 km  
13 (following above normal years), respectively, as  
14 opposed to any other specific location, is essential to  
15 avoid jeopardy and/or adverse modification. Remand is  
16 required.  
17

18 (13) Federal Defendants' reliance on turbidity as one  
19 of several triggers for Action 1 was not arbitrary,  
20 capricious, or clear error.

21 (14) Plaintiffs' argument that FWS violated the ESA  
22 and/or the APA by excluding data from 2007 in its  
23 analysis of entrainment effects, but including it in  
24 its calculation of the ITL is without merit. FWS  
25 offered a reasonable explanation for these choices.  
26

27 (15) The BiOp provides a reasonable explanation for why  
28

1 the 2006-2008 year range was used to calculate the  
2 adult delta smelt ITL, but unlawfully fails to explain  
3 why 2005 was added to the juvenile ITL calculation.  
4 Remand is required.

5 (16) The BiOp also fails to explain why FWS chose to  
6 set the ITL based on the average cumulative salvage  
7 index for the years selected. FWS shall explain this  
8 choice on remand.  
9

10 (17) In general, the BiOp's conclusions about the  
11 causal connections between Project Operations and  
12 "other stressors" are ambiguous. However, the BiOp's  
13 assertion that Project Operations contribute to and/or  
14 exacerbate the impacts on delta smelt of predation,  
15 aquatic macrophytes, and microcystis are unsupported by  
16 record evidence and/or explanation. Remand is  
17 required.  
18

19 (18) The record does not support the BiOp's conclusion  
20 that food web and pollutants/contaminant impacts are  
21 indirect effects of Project operations. Remand is  
22 required.  
23

24 (19) Plaintiffs' omnibus challenge to the substance of  
25 the critical habitat analysis fails. However, the  
26 critical habitat analysis does not specifically explain  
27 its conclusion that Project operations are reasonably  
28

1 certain to exacerbate the impact of contaminants to  
2 delta smelt habitat. In addition, because critical  
3 habitat conclusion 3(c) explicitly relies upon the  
4 flawed analysis regarding the movement of X2, this  
5 conclusion is without support in the record and is  
6 arbitrary and capricious. Remand is required.  
7

8 (20) Although there is record support for the BiOp's  
9 conclusion that Project operations are likely to  
10 jeopardize the continued existence and/or adversely  
11 modify the critical habitat of the delta smelt, the  
12 analyses supporting the specific flow prescriptions set  
13 forth in the RPA are fatally flawed and predominantly  
14 unsupported. The BiOp does not justify or explain its  
15 attribution to Project operations adverse impacts  
16 caused by others stressors. When combined, the  
17 totality of these failures demand remand to the agency  
18 for further consideration and explanation.  
19

20 (B) Plaintiffs' motion for summary judgment that the BiOp  
21 does not segregate discretionary from nondiscretionary  
22 actions is DENIED; Federal Defendants' and Defendant-  
23 Intervenors' cross motions are GRANTED.  
24

25 (C) Plaintiffs' motion for summary judgment that the BiOp  
26 does not undertake the analysis required by 50 C.F.R. §  
27 402.02 is GRANTED; Federal Defendants' and Defendant-  
28

1 Intervenor's cross motions are DENIED. The BiOp completely  
2 fails to analyze economic feasibility, consistency with the  
3 purpose of the action, and consistency with the action  
4 agency's authority demanded by § 402.02. Further analysis  
5 in compliance with § 402.02 is required on remand.

6 (D) Plaintiffs' motion for summary judgment that FWS did not  
7 address comments on the draft BiOp is DENIED; Federal  
8 Defendants' and Defendant-Intervenor's cross motions are  
9 GRANTED.

10 (E) Stewart & Jasper's motion for summary judgment that the  
11 BiOp failed to consider the economic impacts of promulgating  
12 the RPMs is DENIED; Federal Defendants' and Defendant-  
13 Intervenor's cross motions are GRANTED.

14 (F) Stewart & Jasper's motion for summary judgment that FWS  
15 illegally arrogated authority to itself over Reclamation and  
16 DWR is DENIED; Federal Defendants' and Defendant-  
17 Intervenor's cross motions are GRANTED.

18 (G) Family Farm Alliance's motion for summary judgment on  
19 its IQA claim is DENIED; Federal Defendants' and Defendant-  
20 Intervenor's cross motions are GRANTED.

21 (H) Plaintiffs' renewed motion for summary judgment that FWS  
22 violated NEPA is DENIED; Federal Defendants' and Defendant-  
23 Intervenor's cross motions are GRANTED.

24 (I) Plaintiffs' motion for summary judgment that Reclamation  
25  
26  
27  
28



1 violated the ESA is DENIED; Federal Defendants' and  
2 Defendant-Intervenors' cross motions are GRANTED.

3 The 2008 BiOp and its RPA are arbitrary, capricious, and  
4 unlawful, and are remanded to FWS for further consideration in  
5 accordance with this decision and the requirements of law.  
6 Plaintiffs shall submit a form of order consistent with this  
7 memorandum decision within five (5) days of electronic service.  
8

9 A status conference is set for January 4, 2011, at 12:00  
10 noon, in Courtroom 3 (OWW), to address any need for further  
11 proceedings.

12  
13 SO ORDERED

14 Dated: December 14, 2010

15  
16 /s/ Oliver W. Wanger  
17 Oliver W. Wanger  
18 United States District Judge  
19  
20  
21  
22  
23  
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