

U.S. Fish and Wildlife Service's Response to the Family Farm Alliance Information
Quality Act (IQA) Appeal of the
Draft Effects Analysis of the Biological Opinion on the Continued Long-Term
Operations of the Central Valley Project (CVP) and the State Water Project (SWP)
April 1, 2009

The Family Farm Alliance (FFA) submitted a correction request under the IQA to the Fish and Wildlife Service (FWS) on December 14, 2008. On March 12, 2009, the FWS responded to the 25 detailed correction requests (CR) submitted by the FFA. On April 1, 2009, the FFA appealed the FWS' response. This document constitutes the FWS response to the FFA appeal.

The response is separated into two parts. Part 1 responds to legal and policy issues raised in the appeal and Part 2 responds to the science issues. The 25 detailed CRs contained many overlapping and redundant issues. As a result, a response will be provided on a particular topic and then the CRs to which it applies will be listed.

Part 1

Issue: Allegations of violation of the Endangered Species Act. (CR1, 3, 6, 7, 12, 13, 20, 21, 22)

Response: Allegations of violation of the Endangered Species Act (ESA) cannot be resolved in an IQA request for correction because the determination of legality of a FWS decision does not fall under the purview of the IQA. The IQA allows an affected person to request correction of information that underlies a FWS decision but not to challenge the decision itself. The request for correction and appeal repeatedly allege violations of the ESA but this response is not the appropriate venue to address those allegations, therefore, no correction of information is required.

Issue: Modification by FFA of scope of appeal from the draft effects analysis to the "2008 Biological Opinion". (CR1, 2, 3, 5, 7, 8, 9, 10, 11, 14, 15, 19, 22)

Response: The December 14, 2008, request for correction submitted by the FFA cited the draft effects analysis dated October 17, 2008 as the document in need of correction. The October 17 version was produced by the FWS for the purpose of receiving internal and external reviews and, after modification, was included in the Final Biological Opinion. The FFA appeal repeatedly cites the "2008 Biological Opinion" as containing the information that needs correction rather than the October 17, 2008, draft effects analysis. However, in the interests of responding to the issues raised by the FFA, the FWS will consider the issues as presented in the 2008 Final Biological Opinion. No correction of information is required.

Issue: Correction requests to remove all assumed effects, general assumptions and statements regarding direct and indirect adverse effects and replace them with specific statements supported by data. (CR 1, 2, 5, 6)

The FWS may use scientifically-based assumptions about how biological systems operate and how they are affected by a variety of factors if those assumptions are drawn from pertinent scientific works. Such scientifically-based assumptions provide a framework for FWS scientists to evaluate biological impacts. In addition, the FWS repeatedly finds situations where it is evaluating the effect of a project on a species and gaps in the data are present. The Final ESA Section 7 Consultation Handbook (March, 1998) directs the FWS biologist to either seek an extension of the due date for the biological opinion until sufficient information is developed for a more complex analysis; or *develop the biological opinion with available information giving the benefit of the doubt to the species (italics added)*. For example, in the Effects Analysis of the 2008 biological opinion, the FWS states its assumptions about how CVP/SWP affect delta smelt, doing so based on several scientific papers [Bennett and Moyle (1996); Bennett (2005); Sommer et al. 2007; Baxter et al. 2008]. The FWS concludes that paragraph with the following contextual statement: “The decline of delta smelt cannot be explained solely by the effects of CVP/SWP operations”. This statement provides balance regarding the FWS view of the effects of CVP/SWP operations in the context of a system where such operations are one of numerous threats to the species being consulted on. In another example, the FWS conditions the assumption that the Projects affect delta smelt through entrainment by recognizing that Kimmerer (2008) found that summer non-entrainment mortality had effects on FMWT delta smelt numbers. In addition, the FFA appeal quotes language in the draft EA “...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).” This quote, taken from the draft Effects Analysis helps place the assumption into context.

In the final analysis, FWS is statutorily obligated under the ESA to timely render a biological opinion within the constraint of information that is then available for the agency’s use. We have a responsibility to explain the rationale and logic of that opinion, in writing. That rationale and logic would include assumptions made, data gaps encountered, as well as the data used to arrive at that opinion.

Therefore, no correction of information is required.

Issue: The appeal challenges the FWS’ use of a scientific paper (Grimaldo et al.) that had not yet been published as “...unavailable to the public” and thus, FFA alleges it does not meet the best scientific and commercial data available standard of the Endangered Species Act. (CR 6, 10)

Response: When the 2008 Biological Opinion was written, Grimaldo and his coauthors made two papers available to the FWS that had not been published. The first, “Dietary Segregation of Pelagic and Littoral Fish Assemblages in a Highly Modified Tidal

Freshwater Estuary” had been submitted to *Marine and Coastal Fisheries: Dynamics, Management, and Ecosystem Science* in July 2008 and was accepted for publication in March 2009. The second, “Factors Affecting Fish Entrainment into Massive Water Diversions in a Tidal Freshwater Estuary: Can Fish Losses be Managed?” was submitted for publication in *North American Journal of Fisheries Management* in March 2008 and accepted for publication in March 2009. The FWS submitted its draft effects analysis wherein the papers were cited to both internal and external peer review including a peer review organized by a third party with whom FWS contracted for that purpose. Since the responsibility for preparing the biological opinion rests with the FWS, the question of availability is in reference to the FWS, not the public. As a result, the only correction of information to be made is that both manuscripts should have been cited as “in review” in the 2008 Biological Opinion.

Issue: Are effects of factors such as predation, contaminants, introduced species, food supply, aquatic macrophytes, and microcystis correctly considered as indirect effects of project operations? (CR 4, 17, 18, 20)

Response: The Final ESA Section 7 Consultation Handbook (March 1998) states that indirect effects “...are caused by or result from the proposed action, are later in time, and are reasonably certain to occur...” The Handbook goes on to say that indirect effects may occur outside of the area directly affected by the action. In addition, they are a logical extension of the proposed action. In pages 192-202 of the Biological Opinion, the FWS discusses indirect effects of the project as it relates to primary constituent elements and the various life stages of delta smelt. The FWS’ analysis indicates that the projects’ operations alter flows and water quality constituents remotely in location and time in such a way that it has a causal effect on factors such as predation, contaminants, etc. It is their remoteness in time and location that make them indirect effects. Thus, no correction of information is required.

Issue: The FFA states that they have no obligation to provide scientific literature citations to support their request that assertions made by FWS in the EA are erroneous and should be removed. The FFA states in their appeal: “Since the Alliance did not make the assertions, we have no obligation to provide ‘scientific literature citations’ to support our request that they be removed.” (CR4)

Response: The FWS IQA Guidelines at Section V-2 list the information required in a request for correction. Under bullet 7, Section V-2, the FWS IQA Guidelines state:

“Supporting Documentary Evidence. Provide any supporting documentary evidence, such as comparable data or research results on the same topic. Wherever possible, the requester should link this supporting evidence to specific locations in the text of the document being challenged so that it is clear how the supporting documentation relates to the challenged information.”

The FFA chose to provide supporting documentation for their arguments in only certain instances. The FWS utilized the best scientific and commercial data available to it in the

preparation of the 2008 Biological Opinion. While the FFA may choose to provide no documentation that supports its assertions with respect to the analytical effort undertaken by the FWS, the FWS is under no obligation to expend additional staff time researching topics identified by a requestor but for which no contrary scientific data or information is provided or identified. As a result, no correction of information is required.

Issue: The FFA asserts that the definition of the environmental baseline "...is predicated on a temporal point in time whereby all effects of the proposed operation are measured against some existing baseline. The 2008 Biological Opinion does not describe the baseline per se." The appeal goes on "But, nowhere does that document identify a temporal point whereby a 'before the project' condition and 'after the project' condition can be identified." The appeal continues "The 2008 Biological Opinion provides no such analytical framework or approach." (CR 8)

Response: The Final ESA Section 7 Handbook (March 1998) states: "The environmental baseline is a 'snapshot' of a species' health at a specified point in time." The specified point in time is not a specific calendar date but rather the period of analysis by the FWS starting with acceptance of the final biological assessment (and any additional information required in the review of that document) and usually culminating in the final biological opinion. The baseline is described on pages 140-189 of the 2008 Biological Opinion and includes the appropriate caveat that the biological opinion combines the Status of the Species with the Environmental Baseline since the action has the potential to affect the species throughout its range. The appeal alleges that the 2008 Biological Opinion does not provide an analytical framework for identifying impacts of the projects to the baseline. However, pages 138-139 provide the structure of how the biological opinion goes through that process. Therefore, no correction of information is required.

Issue: Is it appropriate to consider climate change effects in the draft effects analysis and 2008 Biological Opinion? Is FWS required to conduct additional climate analyses evaluating cooler scenarios and detail assumptions and limitations on information involving potential climate scenarios? (CR 9)

Response: The FWS is required to evaluate the effects of the proposed action upon listed species, including how such effects may change over the term of implementing the proposed action, especially when it is contemplated to occur over many years (over twenty years in the context of the 2008 Biological Opinion). To the extent that a range of climate change scenarios are foreseeable to occur during the term of the consulted upon action, the FWS is obligated to evaluate the effects of the proposed action upon the species under such foreseeable conditions, even if such changed conditions are not themselves the result of the consulted upon action. Note that the 2008 Biological Opinion does not make the statement or draw a conclusion that the climate change is an effect of the proposed action.

The biological opinion notes at pages 188 and 202 that there are no quantitative studies regarding how climate change has affected the delta smelt or its designated critical habitat. The biological opinion subsequently notes on page 209 that a number of effects of the proposed action, including that associated with climate change, could not be quantifiably analyzed, due to the lack of data. The climate change information and subsequent discussion is not a principal basis for the FWS position taken in the 2008 Biological Opinion. As a result, the FWS does not choose to spend additional staff resources evaluating this issue. No correction of information is required.

Issue: Did the March 12, 2009, FWS response to the original correction request use the incorrect wording regarding the “best available scientific and commercial data available”? (CR 10)

Response: The March 12, 2009, FWS response to the FFA IQA request for correction used the phrase “best available scientific information” in several instances (CR 6, 10, 16). Therefore, the phrases require correction to read “best scientific and commercial data available”.

Issue: The FFA appeal alleges a responsibility on the part of the FWS to correct errors in scientific papers before using them in the EA. (CR 14, 15, 16)

Response: The basis of a FWS determination is its evaluation of the best scientific and commercial data available. The FWS does not reanalyze the underlying data from each publication that it reviews. Rather, the FWS depends upon the quality of the peer review processes that other organizations use to produce scientific papers. This approach is consistent with the FWS and OMB’s Information Quality Guidelines, under which peer reviewed scientific publications carry with them the presumption of objectivity. On the other hand, FWS takes very seriously its commitment to its evaluation, maintaining full responsibility for how it interprets the scientific literature and for the conclusions it reaches. Furthermore, FWS has its evaluations that qualify as ‘influential scientific information’ peer reviewed consistent with OMB’s Information Quality Bulletin for Peer Review. The FWS does not consider it to be our responsibility under the Information Quality Act to seek data and documentation underlying papers published in the scientific literature so that it can be provided to persons or organizations who request it. We refer you to the authors of each of the studies in which you are interested. Therefore, no correction is required.

Issue: The FFA appeal requests that the effects analysis provide a discussion of the overall population level “take” by export pumping; an explicit discussion of Kimmerer (2008) conclusions regarding the population level effect of export pumping on delta smelt; an explicit discussion of Manly and Chotkowski (2006) conclusions regarding the population level effect of export pumping on delta smelt. The appeal also requests that the effects analysis explicitly consider the conservation and recovery efforts currently underway to benefit delta smelt. (CR 23, 24)

Response: The policy issue under consideration in this instance is whether requesting additional discussion of topics or the addition of topics to a biological opinion or other

decision document is an appropriate request under the IQA. The science aspects of this request will be addressed in Part 2 of this response. It appears to the FWS that the FFA believes that a more expansive discussion of the overall level of take that focuses on its population effects would support its contention that export pumping has minimal effects to the delta smelt and that an expanded discussion of conservation and recovery efforts currently underway would further negate the Projects' effects. The 2008 Biological Opinion renders the FWS decision on the effects of the Projects and considers the effects of export pumping and conservation activities in the process. A request to delve further into these topics apparently with the hope of turning the FWS analysis around, and in the absence of any information presented by the FFA on the benefits of conservation actions not considered by the FWS, appears an inappropriate use of staff time. Therefore, no correction is required.

Issue: The FFA appeal requests correction of the peer review of the draft effects analysis to comply with the FWS and OMB Final Bulletin on Peer Review by using only reviewers who meet the NAS policy for evaluating conflicts; request correction of the scope of the review instructions given to peer reviewers to be consistent with that required under the OMB and FWS Final Bulletin. (CR 25)

Response: The OMB's Final Information Quality Bulletin for Peer Review states on pages 2-3: "To ensure that the Bulletin is not too costly or rigid, these requirements for more intensive peer review apply only to the more important scientific assessments disseminated by the federal government. Even for these highly influential scientific assessments, the Bulletin leaves significant discretion to the agency formulating the peer review plan. In general, an agency conducting a peer review of a highly influential scientific assessment must ensure that the peer review process is transparent by making available to the public the written charge to the peer reviewers, the peer reviewers' names, the peer reviewers' report(s), and the agency's response to the peer reviewers' report(s). The agency selecting peer reviewers must ensure that the reviewers possess the necessary expertise. In addition, the agency must address reviewers' potential conflicts of interest (including those stemming from ties to regulated businesses and other stakeholders) and independence from the agency. This Bulletin requires agencies to adopt or adapt the committee selection policies employed by the National Academy of Sciences (NAS) when selecting peer reviewers who are not government employees. Those that are government employees are subject to federal ethics requirements. The use of a transparent process, coupled with the selection of qualified and independent peer reviewers, should improve the quality of government science while promoting public confidence in the integrity of the government's scientific products."

Thus, the FWS has "significant discretion" in formulating the peer review. The FWS exercised that discretion by subjecting the administrative draft effects analysis and the 2008 Biological Opinion to several levels of peer review. The FWS formed an internal peer review team which consisted of individuals with expertise in the development of complex biological opinions under the ESA. The internal peer review team reviewed the biological opinion and provided substantial input and comments. The next level of review consisted of a team of delta smelt experts from within FWS, California Department of Fish and Game, Environmental Protection Agency, Bureau of Reclamation and persons with academic affiliations. Finally, the FWS contracted with Post, Buckley, Schuh and Jernigan (PBS&J) to

conduct an independent peer review of the administrative draft effects analysis. It is this review that the appeal takes issue with. Of the four members of the peer review team assembled by PBS&J, the appeal criticizes the choices of Kimmerer and Durand because they do not appear to be independent reviewers. No criticisms are leveled at the other two members, Leidy and Rose. The FWS believes that, in spite of the criticisms leveled at the choice of Kimmerer and Durand, the 2008 Biological Opinion received sufficient peer review given the time and financial constraints that the FWS operates under when preparing such an important decision document. The FWS is required to produce a biological opinion in 135 days unless the action agency agrees to extend the timeframe. Thus, time and cost constraints are always an important consideration. In addition, the Service was under a Court Order to complete the biological opinion by December 15, 2008. It is important to point out that the PBS&J review team provided a number of important criticisms of the administrative draft effects analysis recommending substantive changes to it. However, because of the appeal's criticism of the choices of Kimmerer and Durand, the FWS considered the FFA appeal, and decided to engage an independent review panel to consider the science issues raised by the FFA. The FWS engaged PBS&J to convene the independent review panel and to subject their panelists to review of their potential conflicts of interest under the National Academy of Sciences policy. As a result, no additional correction is required.

Part 2

Part 2 provides the FWS' responses to the science issues raised in the FFA IQA appeal. The FWS retained PBS&J to engage an independent expert panel to evaluate the science issues contained in the appeal and provide their views on whether the 2008 Biological Opinion appropriately applied the best scientific and commercial data available relative to those issues. PBS&J selected experts not currently involved in Delta science activities but with expertise in estuarine ecology, fishery science, biostatistics, or hydrology. Prospective panelists were screened for potential or perceived conflicts of interest and those interested in serving were asked to complete a National Academy of Sciences' Background Information and Confidential Conflict of Interest Disclosure form (BI/COI FORM 2). Five panelists were chosen. The panel prepared a report *Independent Expert Panel Review of the Family Farm Alliance's Information Quality Act Correction Requests* which will be made available to the FFA with this response. The report was completed on October 21, 2009.

The appeal contains 25 CRs with substantial overlap and duplication among them. As a result, the FWS worked with PBS&J to condense the CRs into a list of scientific topics that covered the issues in the appeal and was workable for the expert panel. This process resulted in 9 panel review questions. Each question will be presented below with the FWS response following it.

Panel Review Question 1: Review use of Rose (2000) as appropriate for the FWS' position on three assumptions of Project effects. Is the approach for interacting stressors consistent with the Rose paper? If so, does the paper support the assumptions as used by the FWS? (CR 1, 5, 6, 7)

Response: Scientifically-based assumptions appropriately provided the basis of an analytical framework for the 2008 Biological Opinion. The paper by Rose (2000) was an important part of the analytical framework used by FWS because the Opinion had to evaluate the effects of anthropogenic changes on delta smelt populations. Rose (2000) correctly

recognizes that this is both difficult and controversial. The approach suggested by Rose allows consideration of both direct and indirect effects on delta smelt.

The Expert Panel says of Rose (2000), “Further, the Panel feels that the issues and approach outlined in the paper are valid and robust in terms of improving the quantification of effects.” The Panel reviewed the Opinion as it relates to the six issues identified by Rose and found his approach utilized “to a varying degree” in 4 sections of it. Further, the Panel states, “The spatial extent and long-term nature of the data set on fish and other factors in the Delta region provide a strong basis for addressing the issues of detectability, regional predictions, and community interactions.” The Panel suggested that the Opinion could have been made clearer had it organized the Effects Analysis according to Rose’s 6 issues or provided a simple conceptual model to guide the reader through it. The Panel also noted that some issues received less treatment than others i.e. sublethal effects and cumulative effects, however, FWS had less data to evaluate on these topics. In regard to multiple stressors on the smelt population, the Panel states: “The Panel felt that the *Baseline* section of BO did describe the role of several stressors on the smelt population, and *in effect* does cover past and present multiple stressor effects.” The Panel’s conclusion is that the Opinion employed Rose’s approach “credibly” through a multidisciplinary team, model results, and analysis of extensive temporal and spatial data sets. Further, the Panel also states that the three assumptions in the Opinion were addressed as well as a fourth, on interacting effects.

The FWS’ interpretation of the Panel’s report on Panel Review Question 1 is that there are no significant shortcomings in the Opinion’s analyses that would lead us to believe it is flawed to the degree where major incorrect conclusions were reached regarding Project effects on the delta smelt. To be sure, the Panel points out ways to improve the presentation in the Opinion and places in the document where additional analyses would have strengthened it but nothing more. Therefore, no correction is required.

Panel Review Question 2: Does entrainment of delta smelt at Project facilities drive the smelt population and what is the frequency of these events? If so, is the methodology presented in the Effects Analysis based on the best available scientific and commercial data, accurately calculated, and based on scientifically valid assumptions? (CR 2, 3, 14, 15, 23)

Response: The 2008 Biological Opinion states: “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).” The Panel elaborates on this statement by saying that it would be difficult to isolate any single factor, including entrainment, as the key to smelt population dynamics. Rather, they go on to say that researchers acknowledge that multiple factors affect the quantity and quality of habitat for delta smelt and that smelt may be exposed to multiple stressors. The Panel lists many stressors but believe that a decline in food resources is a critical stressor. Further, the Panel observes that not all stressors lend themselves to management but that “...changes in the operation of the project facilities to protect biological populations of concern in the Delta remain a practical management tool”. More importantly, the Panel points out that the effect of an important contributor to population dynamics is not always determined by its magnitude. Small changes in the vital rates of a population may determine whether a population increases or decreases. Likewise, they observe that entrainment results in direct mortality and that current measurements underestimate entrainment loss. The Panel suggests

that total entrainment is not the best metric for determining population impacts. Rather, they suggest an approach where impact is determined as a ratio of entrainment to abundance. Using data from Newman (2008) and Grimaldo et al. (2009), the Panel created such ratios which indicate an increase in proportionate loss due to the salvage component of entrainment which coincides with more recent, prolonged low populations of delta smelt.

Last, the Panel discusses Kimmerer (2008) and Newman (2008) in relation to their “proportional entrainment” estimates which they believe “...constitute the best scientific and commercial data available to the USFWS at the time of BO preparation”. The Panel says of these papers: “Together they suggest that entrainment-related mortality may account for a substantial proportion of the population in some years, thus supporting a contention that pumping may have an important ‘sporadic’ effect on delta smelt abundance, particularly during the last decade.”

Therefore, the FWS’ contention in the 2008 Biological Opinion that entrainment appears to have important sporadic impacts on the smelt population remains a reasonable scientifically based conclusion. The Panel again suggests some ways to improve the analyses (more emphasis on the ratio of entrainment to population rather than total entrainment) but nothing is presented to indicate the FWS had made a serious error in interpretation or application of the scientific data presented to it. Thus, no correction is required.

Panel Review Question 3: Three Parts (CR 2, 4, 13, 17, 18, 19, 20, 21)

Panel Review Question 3A: Do Project operations control the hydrodynamics of the Delta?

Response: Yes. “Project pumping is the primary force acting on the hydrodynamics of the Delta, based on the fact that the net flow direction has changed since the initiation of pumping.”—Expert Panel Report, page 9. While tides and wind vary from hour to hour and day to day, they do not significantly influence the average monthly inflow to the Delta. The Project induced changes in Delta hydrodynamics are major compared to wind or tide. Therefore, no correction is required.

Panel Review Question 3B: Is the assertion by the USFWS that Project operations exacerbate the effects these other factors have on smelt based on the best available scientific and commercial data?

Response: The Panel states: “The assertion seems reasonable based on the findings and observations of numerous researchers in the Delta who have related shifts in the habitat quantity (e.g. information on X2) and quality (e.g. food supply) to aspects of pumping operations.” Since project pumping is the primary hydrodynamic force in the Delta, it is reasonable to conclude that a species like delta smelt, with a relatively narrow range of habitat requirements, would be impacted both directly and indirectly by it. Therefore, no correction is required.

Panel Review Question 3C: Are low stable fall flow conditions dependent on Project operations? If so, do these flows reduce phytoplankton production, improve conditions for *Corbula amurensis*, or non-native fish, and if they do, what is the effect on smelt?

Response: As stated in the 2008 Biological Opinion, Project operations contribute to low, stable fall flow conditions and the Panel agrees by saying: “Given that the project pumping operations contribute to low, stable fall-flow conditions by decreasing Delta outflows (as explained in Panel Response 9A), there are likely consequences to a variety of biological and chemical factors that influence the delta smelt population.” Since the topic is fall flow conditions, the geographic area of most concern is the western portion of the Delta where delta smelt are most likely concentrated. The Panel believes that X2 is a scientifically compelling environmental index for suitable abiotic smelt habitat and that the eastward shift in the salinity regime where delta smelt are found at this time of the year would benefit *Corbula amurensis*. Further, the Panel opines that *Corbula* may decrease phytoplankton biomass as the base of the Delta’s foodweb. The FWS believes that this situation contributes to reduced food availability for delta smelt. Therefore, no correction is required.

Panel Review Question 4: Is the linear relationship used by the USFWS to relate OMR flow to smelt salvage scientifically valid and based on the best available (scientific) and commercial data? (CR 6)

Response: The linear relationship was described in Grimaldo et al. (*J. Fish. Mgmt. Factors Affecting Fish Entrainment in Massive Water Diversions in a Tidal Freshwater Estuary: Can Fish Losses be Managed?* 2009) which was peer reviewed. The FWS accepts the peer review processes of scientific journals and thus, the scientific validity of the paper’s conclusions. However, the Panel reports that while the linear relationship fit marginally better than an exponential model based upon communications with Dr. Grimaldo, they suggest that with a larger data set, the relationship is likely to be exponential. However, in the flow range recommended in the reasonable and prudent alternative of the 2008 Biological Opinion, the linear relationship is a better statistical fit. Therefore, if the FWS extrapolates the linear relationship, it must consider that the analytical results may differ from those of an exponential model. As a result, if analyses are conducted outside the range of flows recommended in the reasonable and prudent alternative, an exponential model would be considered if the statistical fit is superior to a linear relationship. Therefore, no correction of information is required.

Panel Review Question 5: Is the relationship in Grimaldo et al. (2009) scientifically sound and was it used properly by the USFWS? (CR 6, 10)

Response: The Panel found that the linear model and the exponential model produced similar results over OMR flows of -7,500 cfs to + 5000 cfs. Only when negative flows were outside of that range would the exponential model predict substantially greater salvage than the linear model. The Panel says: “Thus, as a practical matter, it would have made little difference if the USFWS had used a non-linear model as compared to the linear model that they adopted.” Grimaldo et al. (2009) was published in a peer reviewed scientific journal and the FWS accepts the peer review process employed by reputable scientific publications. Thus, no correction is required.

Panel Review Question 6: Is the USFWS discussion of entrainment of *P. forbesi* in the BO based on the best scientific and commercial data, scientifically valid, and does the Project entrain *P. forbesi* at a level which could affect smelt populations? (CR 7, 12)

Response: The importance of *P. forbesi* as a food item for delta smelt is well documented. Likewise, documentation of declines in the central Delta of *P. forbesi* exists as well as delta smelt being food limited. The Panel states: “The BO uses the best available scientific and commercial data when asserting that actions negatively impacting *P. forbesi* also negatively impact smelt regardless of the time of the year.” While the FWS is unaware of data that quantitatively relates entrainment of food items to an effect on smelt populations, the FWS believes that loss of *P. forbesi* to entrainment could possibly exacerbate the present food limitations that delta smelt are experiencing. Thus, this contextual statement is the only correction required.

Panel Review Question 7: A two part question. (CR 8)

Panel Review Question 7A: Based on the available data (e.g. Feyrer et al. 2007; Manly 2008) is the location of X2 a scientifically defensible index for identifying suitable delta smelt habitat availability?

Response: The FFA appeal cites Manly (2008) but does not provide a citation where the Panel could find the publication. Manly (2008) was not cited in the 2008 Biological Opinion. Thus, it was not considered. The FWS believes that X2 is an appropriate index for delta smelt habitat and the Panel concurs by saying: “The X2 index is extremely well supported as scientifically valid.” Feyrer et al. (2007) support X2 but identified a need to consider other environmental metrics (i.e. light availability) to evaluate smelt habitat as well. The Panel concludes by saying: “USFWS’s use of the X2 index uses the best available scientific and commercial data and is highly defensible.” Therefore, no correction of information is required.

Panel Review Question 7B: Based on the best commercial and scientific data are there better indices available than those used by the USFWS in the Effects Analysis, for predicting future smelt abundance (e.g. food, temperature, turbidity, etc.) than fall X2?

Response: The Panel, in an additional response, states: “Further, it seems unreasonable to propose new indices that could potentially compete with X2. Based on best available scientific data, fall X2 provides a robust index of the physical habitat availability of smelt and likely influences biotic components (as discussed in the Panel’s report).” The Panel indicates that X2 provides a means of tracking critical physical habitat and is not a predictor of future smelt abundance. FFA’s CR 8 references Manly (2008) as a source identifying factors that would improve smelt abundance analysis but gave no citation for the paper nor did the FWS include it in the Opinion. As a result, the Panel could not evaluate this issue further. Therefore, no correction of information is required.

Panel Review Question 8: Is the comparison of modeled data to historical conditions a valid exercise as presented in the BO? Did the comparison of modeled data to historical conditions bias the results and, further, did the USFWS bias the results by the selection of years to use?

Response: The FWS believes that a comparison of modeled data to historical data is valid. The Panel concurs and reproduces a portion of the peer review report completed on the draft biological opinion in late 2008 as explanation of its position. The Panel suggested that comparisons using the same fixed time periods would have been a better choice in the Opinion. However, the Panel evaluated whether the FWS’ choice of “imperfectly-

overlapping years” biased its results. The Panel concluded that the FWS did not seriously bias its conclusions as a result. Therefore, no correction of information is required.

Panel Review Question 9: A two part question. (CR 17, 20)

Panel Review Question 9A: Check veracity of statement that Project increases fall flows.

Response: The FFA alleges in their appeal that extremely stable low delta outflow conditions in the fall occur naturally and that project operations increase fall flows and thus, alleviate conditions caused by low flows. The FWS disagrees with this contention. The Panel tested the FFA allegations by using both DAYFLOW and CALSIM II Delta outflow simulation models and both models showed a decrease in Delta flow compared to the unimpaired flows. The Panel reports that natural and unimpaired flows have the same potential hydrologic basin runoff but that unimpaired flow assumes that mountain watersheds and river channels function with modifications for reclamation, flood control, and navigation. The Panel’s analysis indicates that the FFA’s contention is not supported. Therefore, no correction of information is required.

Panel Review Question 9B: Are low stable fall flow conditions dependent on Project operations? If so, do these flows reduce phytoplankton production, improve conditions for *Corbula amurensis*, or non-native fish, and if they do, what is the effect on the smelt?

Response: See response to Panel Review Question 3C.