why unscaled analyses are nevertheless useful. Federal Defendants must also further explain and/or refine the statistical methodologies used to develop these figures." *Id.* at 955-956.

- "The record does not support the BiOp's conclusions about the connection between Project operations on the one hand and pollution and/or food limitations on the other. This is not the best available science." *Id.* at 956.
- "[T]he BiOp does not clearly explain the rationale for imposing a 4:1 ratio in above normal and wet years. Particularly in light of the potential adverse consequences of imposing such a ratio, this is unlawful." *Id.* at 957.
- "Likewise, although there is marginal record support for the imposition of some form of OMR flow restriction, Action IV.2.3 must be remanded for further explanation of the necessity for the specific flow prescriptions imposed, which are derived primarily from FTM simulations, a method that is undisputedly an imperfect, if not incompetent, predictor of salmon behavior." *Id.* at 957.
- "Action IV.3 suffers from a similar defect. Although there is record support for some form of action designed to prevent large numbers of fish from being killed or harmed at the export facilities, lawful explanation is required to justify the specific triggers imposed by Action IV.3." *Id.* at 957.
- "Federal Defendants failed to sufficiently explain whether the RPA can be implemented consistent with the co-equal, non-environmental statutory purposes of the action." *Id.* at 957.
- "[W]hile there is anecdotal evidence for some of the general approaches used in these RPA Actions, the specific prescriptions imposed are not sufficiently justified or explained. NMFS acted arbitrarily and capriciously in concluding that Actions IV.2.1, IV.2.3, and IV.3 are essential to avoid jeopardy and/or adverse modification." *Id.* at 957.

In light of these and other serious flaws in the last biological opinions, Reclamation, FWS, and NMFS must engage in a fundamental reanalysis of the effect of CVP and SWP operations on the listed species, and the necessity for and efficacy of any measures intended to address such effects. For their part, FWS and NMFS must do such reanalysis and issue new biological opinions. For its part, Reclamation must consider those new opinions, and make a determination of its ESA obligations. In performing these tasks, all the federal agencies should carefully consider the data and analysis of impacts and alternatives produced through the NEPA process.

Reclamation must prepare a new biological assessment for the new consultations. A new biological assessment is necessary both because of new scientific data and studies that have become available since 2008, and because of changes in current and planned project operations since 2008. Among other recent information, new science since 2008 includes life-cycle models, analyses of ammonium impacts on the food web, and analyses addressing the need for a "fall X2" measure. An example of changed project operations is implementation of the San Joaquin River Restoration Program, which requires the restoration of flows to the San Joaquin River Basin and the reintroduction of spring-run Chinook salmon into the San Joaquin River. Reclamation has already begun modifying the flows that reach the Delta, and reintroduction of spring-run Chinook salmon to the San Joaquin River is scheduled to begin by December 31, 2012.

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The consultation must also consider other, ongoing regulatory and permitting processes that will influence project operations and the affected environment. The BDCP is expected to provide the basis for endangered species permits for, and a biological opinion regarding, in-Delta operations of the SWP and CVP beginning in about 2025. The draft BDCP is scheduled to be released in late 2012 and finalized in 2013. Elements of the BDCP not involving CVP and SWP operations will improve conditions for listed species even before new facilities become operative in 2025. Also, the State Water Resources Control Board ("State Water Board") is in the process of revising its existing Bay-Delta Plan. This revision may include updated or new objectives (e.g. San Joaquin River flow objectives) that could impact project operations. All that and more must be considered in a new biological assessment, and in the new biological opinions.

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A final issue related to the new consultations is what period of project operations should be included in the consultation. The FWS and NMFS will issue new biological opinions for BDCP that will address in-Delta CVP and SWP beginning in 2025. Those biological opinions will then supersede the biological opinions that result from the reconsultation pursuant to the remand. Accordingly, the Public Water Agencies suggest that the reconsultation, and the related NEPA review, address project operations until in-Delta CVP and SWP operations are covered through the BDCP permits and BDCP-related biological opinions.

B. The NEPA Rulings

The district court did not direct what level of NEPA review Reclamation should undertake on remand. In the *Consolidated Delta Smelt Cases* the district court ruled that Reclamation's provisional acceptance and implementation of the 2008 Delta Smelt BiOp and its RPA constituted "major federal action" because those actions represented a significant change to the operational status quo of the coordinated operations of the CVP and SWP. (Memorandum Decision re Cross Motions for Summary Judgment on NEPA Issues (Nov. 13, 2009), Doc. 399 at 33, 42.) The court explained that the "critical inquiry" with respect to the "major federal action" issue is 'whether the BiOp causes a change to the operational status quo of an existing project." (Doc. 399 at 33.) The court concluded that the "RPA will be implemented by altering flow patterns' and "implementing such management actions constitutes a new and unprecedented change in project operations, which will have restrictive impacts that have the potential to be major and adverse." (Doc. 399 at 36, fn. 13.) The court explained that "Reclamation's decision to implement the RPA is a 'revision [of] its procedures or standards' for operating the Jones pumping plant and other facilities significantly affecting OMR flows" and is therefore "major federal action because it substantially alters the status quo of the Projects' operations." (Doc. 399 at 41-42 [alteration in original].)

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The district court explained that where the "major federal action" component for triggering NEPA is met, "an agency must prepare an EIS 'where there are substantial questions about whether a project may cause degradation of the human environment.'" (Doc. 399 at 42 [quoting *Native Ecosystems Council v. U.S. Forest Serv.*, 428 F.3d 1233, 1239 (9th Cir. 2005)].) The court found it undisputed that "implementation of the RPA reduced pumping by more than 300,000 AF in the 2008-09 water year" and that such reductions in exports from the Delta may place greater demands upon alternative sources of water, including groundwater. (Doc. 399 at

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43.) The court also found the "potential environmental impact of groundwater overdraft is beyond reasonable dispute." (*Id.*) The court concluded that this, in and of itself, "raises the kind of 'serious questions' about whether a project may cause significant degradation of the human environment, requiring NEPA compliance." (Doc. 399 at 44.) The court therefore held that Reclamation must comply with NEPA and that "NEPA applies to Reclamation's acceptance and implementation of the BiOp and its RPA." (*Id.*)

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The district court's summary judgment ruling on the NEPA issue in the *Consolidated Salmonid Cases* relied heavily on the analysis contained in the *Consolidated Delta Smelt Cases* NEPA ruling. *Consol. Salmonid Cases*, 688 F. Supp. 2d 1013 (E.D. Cal. 2010). The district court concluded that "Reclamation's operation of the projects to comply with the 2009 Salmonid BiOp RPAs is major federal action under NEPA." *Id.* at 1024. The court concluded that "implementation of the 2009 Salmonid BiOp is not a continuation of the status quo" and "implementation of the RPA constitutes a non-trivial 'revision of procedures or standards' for the operation of the Projects with draconian consequences." *Id.* at 1031, 1032. The court concluded that at the very least, the OMR Flow Restrictions in the RPA constituted "a significant revision to Reclamation's procedures and standards for operating the CVP." *Id.* at 1033. The court found that "it is hard to imagine more significant adverse effect to the human environment than were effectuated by implementation of the RPAs." *Id.* at 1032. The court found that it was undisputed that "the RPA will materially reduce water exports by 5-7 percent, or approximately 330,000 AF" and concluded that it was beyond dispute "that such reductions have the potential to significantly effect the human environment . . ." *Id.* at 1032. The court therefore concluded that there was no dispute that "'there are substantial questions' about whether coordinated operation of the CVP and SWP under the RPAs 'may cause significant degradation of the human environment'" and that "[n]o more is required to trigger NEPA." *Id.* at 1034.

The common thread in both decisions is that Reclamation must analyze under NEPA the potential impacts of any proposal or plan to modify the longstanding and ongoing coordinated operations of the CVP and SWP before making any such changes to CVP and SWP operations pursuant to an ESA section 7 consultation. Thus, the ultimate scope of Reclamation's task under NEPA depends upon the outcome of the ESA section 7 consultation among Reclamation, FWS and NMFS. If after consultation with FWS and NMFS Reclamation concludes that project operations will not jeopardize the listed species or adversely modify their critical habitat, then no major changes to the regime governing project operations should be required, and hence there would be no significant effects on the existing human environment triggering the need for an EIS. In that circumstance, an environmental assessment would likely suffice to meet NEPA's requirements. The NOI indicates that Reclamation has decided to prepare an EIS. That is a discretionary choice NEPA allows, even if upon further analysis the likely environmental impacts are revealed to be minor. Our point here is only that if there are no major changes to CVP and SWP operations, then an EIS likely would not be required.

On the other hand, if the new consultation results in a finding of jeopardizing effect or adverse modification of critical habitat, then Reclamation must consider what reasonable and prudent alternatives ("RPAs") to proposed operations are both necessary and efficacious. If Reclamation concludes that major changes to project operations will be required in order to avoid jeopardizing listed species or adversely modifying their critical habitat, then the scope of

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Reclamation's task to meet NEPA's requirements will increase substantially.[3] The major changes to CVP and SWP operations required by the RPAs in the last biological opinions, for example, resulted in devastating adverse environmental and socioeconomic impacts within the project service areas, including particularly within the west side of the San Joaquin valley. Under the district court's ruling, Reclamation would then be duty bound to consider the impacts from changes in project operations on the quality of the human environment, as well as alternatives that may lessen those impacts while still meeting the requirements of the ESA. That will require an EIS.

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Although the ultimate scope of the required NEPA review will vary depending upon what changes to project operations, if any, Reclamation decides are needed to meet its obligation under ESA section 7, the NEPA and ESA processes may and should proceed concurrently. *See* 40 C.F.R. § 1502.25(a); 50 C.F.R. § 402.06; NEPA Handbook at 3-21 – 3-23. Based on the NOI, it appears that Reclamation agrees that it may and should begin its NEPA process well before the section 7 consultation is completed. Information developed in the NEPA process should inform and improve the ESA consultations. Likewise, information developed during ESA consultation should be considered for the NEPA process.

C. Deadlines For Completing Remand

Reclamation must complete its ESA consultation and NEPA review by deadlines ordered by the district court. These deadlines differ between the two cases. The respective deadlines are:

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	Consolidated Delta Smelt Cases	*Consolidated Salmonid Cases*
Draft BiOp	Oct. 1, 2011	Oct. 1, 2014
Draft EIS		April 1, 2015
Final EIS	Nov. 1, 2013 (Within 25-months of receiving draft BiOp / RPA)	Feb. 1, 2016
Final BiOp	Dec. 1, 2013	Feb. 1, 2016
Record of Decision		April 29, 2016

These dates were set by the court after consideration of representations by the federal agencies regarding how much time they needed to complete each consultation and related NEPA review.

It appears from the NOI that Reclamation may intend to analyze in a single EIS the effects of any changes to CVP and SWP operations for both the delta smelt and salmonid species. Under the remand schedules set by the court in the two cases, the entire remand process related to delta smelt must be completed by December 1, 2013, while even a draft salmonid biological opinion is not due to be completed until October 1, 2014. Hence, unless Reclamation and NMFS complete the remand required by the judgment in the *Consolidated Salmonid Cases*

[3] We do not address here the obligations of FWS and NMFS under NEPA, as the NOI relates solely to Reclamation's intention to prepare an EIS. The obligations of FWS and NMFS with respect to the existing biological opinions are the subject of ongoing litigation in the Ninth Circuit, and nothing in or absent from this letter should be construed as a waiver of any position regarding the NEPA obligations of those agencies.

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much more quickly than the court's schedule would require, a change in schedule will be necessary to accommodate a combined analysis integrating all the listed species. Depending upon further clarification and discussions with Reclamation, FWS, and NMFS, the Public Water Agencies would consider supporting a change in the remand schedules if reasonably necessary for the purpose of allowing an integrated analysis covering all the listed species.

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The existing separate remand schedules allow Reclamation, FWS, and NMFS more than adequate time to complete the full analyses required under NEPA and the ESA separately. The court's requirement that the agencies meet dates certain does not excuse an abbreviated, outdated or incomplete analysis. However, if the federal agencies now believe that either existing schedule would preclude them from doing such full analysis, then the Public Water Agencies are open to discussions with them regarding potential adjustments. Again depending upon further discussions with the federal agencies, the Public Water Agencies would consider supporting an extension of time if and to the extent necessary to do the full analyses required by the ESA and NEPA.

IV. NEPA'S REQUIREMENTS

NEPA has a number of requirements that must be carefully followed in order to be legally compliant with the statute and implementing regulations. We address several of these obligations below, in response to the limited information provided in the NOI. As Reclamation decides upon and reveals more about its intended NEPA review, we will likely have additional comments to provide.

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A. Purpose And Need

An EIS must contain a statement of "purpose and need" which briefly specifies "the underlying purpose and need to which the [lead] agency is responding in proposing the alternatives including the proposed action." 40 C.F.R. § 1502.13. The purpose and need statement "is a critical element that sets the overall direction of the process and serves as an important screening criterion for determining which alternatives are reasonable." NEPA Handbook at 8-5. This purpose and need are important because they will inform the range of alternatives ultimately selected for analysis in the EIS and "[a]ll reasonable alternatives examined in detail must meet the defined purpose and need." *Id.*

The Department of the Interior's NEPA regulations provide that in "some instances it may be appropriate for the bureau to describe its 'purpose' and its 'need' as distinct aspects. The 'need' for the action may be described as the underlying problem or opportunity to which the agency is responding with the action. The 'purpose' may refer to the goal or objective that the bureau it trying to achieve, and should be stated to the extent possible, in terms of desired outcomes." 43 C.F.R. § 46.420(a)(1).

The NOI states that the "purpose" of the action "is to continue operations of the CVP, in coordination with the SWP, as described in the 2008 Biological Assessment (as modified) to meet its authorized purposes, in a manner that: [1] [i]s consistent with Federal Reclamation law, applicable statutes, previous agreements and permits, and contractual obligations; [2] [a]voids

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jeopardizing the continued existence of federally listed species; and [3] [d]oes not result in destruction or adverse modification of designated critical habitat." 77 Fed. Reg. at 18859. Regarding "need," the NOI mentions only the CVP, stating that continued operation of the CVP is "needed" to "provide flood control, water supply, fish and wildlife restoration and enhancement, and power generation. It also provides navigation, recreation, and water quality benefits." *Id.* The NOI then goes on to observe, however, that coordinated project operations were "found to likely jeopardize the continued existence of listed species and adversely modify critical habitat. *Id.* This is an apparent reference to the conclusions of the two biological opinions the district court found to be fundamentally defective, and which will be superseded by new biological opinions after completion of reconsultation.

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The Public Water Agencies believe that in this case, the *purpose* of the action and the *need* for the action are distinct—and, the EIS should reflect that difference. Here, the *purpose* of the action, the "goal or objective" expressed in terms of "desired outcomes," should be to continue long-term operation of both the CVP and SWP in a manner that will enable Reclamation and the DWR to satisfy their contractual and other obligations to the fullest extent possible. Importantly, those obligations include optimizing water deliveries to CVP and SWP contractors up to contract amounts, to help meet the needs of 25 million people and 3 million acres of agricultural land.[4] With population growth, the demands on CVP and SWP supplies will likely increase over time.

Compliance with the ESA should not be included in the purpose of the proposed action. Instead, in the context here, providing water supply as fully as possible while still complying with the ESA gives rise to the *need* for the action. The "underlying problem" that Reclamation is responding to is the difficulty both projects have had in serving water supply and other project purposes while complying with the ESA. In recent years, changes to project operations that purportedly were necessary to comply with the ESA have severely impaired the water supply function of the two projects, with disastrous consequences. Reclamation's present NEPA review should therefore be keenly focused on identifying actions it and DWR can take to better serve the water supply purposes of the projects while still meeting the requirements of the ESA. Reclamation's analysis must consider what effect the coordinated operations of the CVP and SWP actually have on species survival and recovery, what measures are proposed to reduce or compensate for such effects, what the data show about the likely efficacy of those measures, and what other effects those measures will cause including through reductions of water supply. That analysis should distinguish between actions that are necessary to comply with the mandates of the ESA, and other actions that may provide some additional protection or benefit for listed species, but are not necessary to comply with the ESA. The statement of purpose and need should make clear that an action alternative under which operations will comply with the ESA with minimal water supply impacts would be deemed superior to an action alternative under which operations will comply with the ESA but cause substantial water supply impacts. The Public Water Agencies' definition of the purpose and need does so, and will help Reclamation to appropriately focus the proposed action and range of alternatives to be considered in the EIS.

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[4] That obligation is typically found in Articles 11(a) and 12(a) of the CVP water service contracts. It is found in Articles 6(b), 6(c) and 16(b) of the standard SWP contract.

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Two statements in the NOI's purpose and need section require additional comment. First, the text states that the purpose of the action is to continue project operations "as described in the 2008 Biological Assessment (as modified)." As stated elsewhere in this letter and in other correspondence with Reclamation, Reclamation must prepare a new biological assessment. We therefore disagree with the NOI to the extent that it implies that no new biological assessment is necessary. Furthermore, DWR and the Public Water Agencies should be permitted to directly and actively participate in the preparation of the biological assessment. Second, as stated elsewhere in this letter and other correspondence, the Public Water Agencies reject any suggestion that the conclusions of the existing biological opinions regarding effects on listed species are a legitimate starting point for the NEPA process or the new consultations. As demonstrated above, those biological opinions and their reasonable and prudent alternatives were remanded because they were not based on the best available science and were otherwise unsupportable and unjustified.

B. Affected Environment

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To fulfill its NEPA duties, Reclamation must also provide a description of the affected environment. Reclamation is required to "succinctly describe the environment of the area(s) to be affected or created by the alternatives under consideration." 40 C.F.R. § 1502.15. This discussion should include "a general description of the physical environment of the project area and a map defining the project area, the associated ecosystem(s), and the affected environment." NEPA Handbook at 8-13. This general description "should include not only the physical setting for the project, but it should describe those features—geographic, cultural, recreational, or unique or significant wildlife or vegetation—that distinguish the affected area from other areas." *Id.* The condition of the affected environment includes the presence of a suite of stressors other than project operations that affect listed species. It also includes conditions within the service areas that are dependent upon water deliveries from the CVP and SWP.

The NOI does not use the term "affected environment." Under the heading "V. Project Area" the NOI states that "[t]he project area includes the CVP and SWP Service Areas and facilities, as described in this section." 77 Fed. Reg. at 18859. We agree that the directly affected environment includes all of the CVP and SWP service areas, as well as the areas where CVP and SWP facilities are located. The service area and project facilities include much of California. To describe the affected environment, the EIS must go further and include a general description of the physical environment within the service areas. 40 C.F.R. § 1502.15. The affected environment should include the area of and conditions within the Delta, and the Sacramento and San Joaquin river watersheds. The affected environment will encompass areas extending beyond the CVP and SWP service areas as well. For example, reductions in water supplies exported from the Delta may increase demands on Colorado River water as an alternative supply for Southern California. Identifying the direct and indirect effects of restrictions on CVP and SWP operations therefore requires consideration of conditions in a broad geographic region.

Accurately defining the extent and present condition of the affected environment is important to the analysis of environmental consequences. "The general description constitutes a basis from which specific environmental effects can be assessed." NEPA Handbook at 8-13. As

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the NEPA Handbook further explains: "If available, the historic changes and trends affecting a resource or feature, up to and including present conditions, should be described to set the stage for the projection of future changes and trends concerning the resource or feature." *Id.* In particular, there are many historic and existing factors and conditions that affect the survival and recovery of listed species, factors that are unrelated to the operations of the projects (e.g., loss of habitat, upstream water use and diversions by other water users, alterations in land uses, municipal and industrial discharges, exotic species etc.). Those factors and conditions should be carefully described as part of the affected environment so that the effects of future project operations are considered in the appropriate context. While the historic changes in the Delta and throughout the area of analysis have occurred and may be identified to "set the stage," the impacts analysis must not attempt to attribute these past changes and existing impacts to any action alternative. Instead, an accurate and complete description of existing conditions is essential because the effects of the "no action" alternative are measured against the *existing* affected environment (e.g., not the environment that existed before the projects began operations).

C. No Action Alternative

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An EIS[5] must "[i]nclude the alternative of no action." 40 C.F.R. § 1502.14(d). From the NOI, it does not appear that Reclamation has yet defined the no action alternative. "Because the no action alternative is the basis to which all other alternatives are compared, it should be presented first, so the reader can easily compare the other alternatives to it." NEPA Handbook at 8-8. According to Reclamation's NEPA Handbook, "'[n]o action' represents a projection of current conditions and reasonably foreseeable actions to the most reasonable future responses or conditions that could occur during the life of the project without any action alternatives being implemented." (*Id.*) Moreover,

> [t]he no action alternative should not automatically be considered the same as the existing condition of the affected environment because reasonably foreseeable future actions may occur whether or not any of the project action alternatives are chosen. When the no action alternative is different from the existing condition, as projected into the future, the differences should be clearly defined. Differences could result from other water development projects, land use changes, municipal development, or other actions. "No action" is, therefore, often described as "the future without the project."

NEPA Handbook at 8-8.

In an EIS, the action alternatives are compared to the no action alternative to measure the impacts of each action alternative. *See, e.g., Center for Biological Diversity v. U.S. Dept. of the Interior*, 623 F.3d 633, 642, (9th Cir. 2010) ("A no action alternative in an EIS allows

[5] Discussion of the requirements of an EIS accepts Reclamation's apparent assumption that an EIS will be required, although that is not a foregone conclusion. As described above, the scope of the required NEPA review will depend upon what actions Reclamation decides are necessary to meet its obligations under the ESA.

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policymakers and the public to compare the environmental consequences of the status quo to the consequences of the proposed action. The no action alternative is meant to 'provide a baseline against which the action alternative[ ]'...is evaluated. *Id.* A no action alternative must be considered in every EIS. *See* 40 C.F.R. § 1502.14(d)."). The district court ruled that Reclamation violated NEPA by significantly modifying project operations to meet ESA requirements without performing any NEPA analysis of the impacts of such modifications or alternatives to such modifications. Accordingly, in order to respond to this ruling on remand, here the "no action" alternative should be defined to include operations consistent with Reclamation's and DWR's obligations and all legal requirements *except* the requirements of the ESA. Under this definition of "no action," project operations would continue in compliance with other regulatory requirements (e.g., D-1641 as modified by applicable laws, including Wilkins Slough requirements, FERC license requirements, American River in-river flow requirements, etc.). Comparing this no action alternative to the action alternatives developed during the NEPA and ESA consultation process will provide the most comprehensive and appropriate disclosure of the environmental impacts of the various action alternatives to comply with ESA requirements.[6]

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When Reclamation defines the no action alternative, it should not include implementation of the RPAs in the 2008 FWS and 2009 NMFS BiOps in the no action alternative. That would contradict the district court's ruling, because the NEPA analysis then would not measure and disclose the impacts of changes to CVP and SWP operations to comply with the ESA. It would defeat the purpose of the no action alternative—to provide a meaningful comparative scenario with which to gauge the impacts of the action alternatives. As the Ninth Circuit observed in a similar context, "[a] no action alternative in an EIS is meaningless if it assumes the existence of the very plan being proposed." *Friends of Yosemite Valley v. Kempthorne*, 520 F.3d 1024, 1038 (9th Cir. 2008).

Appropriately defining the consequences of "no action" will require analysis not done in the previous ESA consultation. The record shows that the conclusions in the existing biological opinions that absent major changes project operations would jeopardize listed species and adversely modify critical habitat were not grounded on rigorous scientific analysis. For example, neither biological opinion employed the standard tool of life cycle modeling to test the significance of the effects of project operations, and other stressors, on the abundance of the listed species. While there is no question that project operations have some effect on individual members of the species through take at the export pumps, the significance of that effect on the overall population was not critically examined. It was instead largely presumed in the existing biological opinions. Further, as the district court found, the biological opinions attributed other adverse effects in the existing environment such as contaminants to project operations based only on speculation and surmise. The absence of sound scientific analysis to support the jeopardizing

[6] The situation here is unlike most other circumstances where NEPA review is performed, because the CVP and SWP were constructed and operating before NEPA and the ESA were even enacted. Thus, the "no action" alternative, which usually serves as the baseline for evaluating the significance of environmental impacts of action alternatives, is more complicated. The existing projects including operations must be captured in the "no action" baseline so they are not included in the new effects of the action alternatives. For this reason, a hypothetical "no action" alternative that fails to account for current and previous operations of the projects would be an improper baseline for comparative analysis. *See American Rivers v. Federal Energy Regulatory Comm.*, 187 F.3d 1007 (9th Cir. 1999).

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conclusions in the existing biological opinions completely undermines the validity of the specific prescriptions they imposed on project operations to remove that supposed jeopardizing effect. Furthermore, as described above, project operations have changed since 2008, and there are other regulatory processes that are underway that may further alter project operations in the coming years, regardless of whether any action is taken to modify project operations pursuant to section 7 of the ESA.

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In the EIS, Reclamation must compare the environmental consequences of the no action alternative to the environmental consequences of the action alternatives. With respect to consequences for listed species, that comparison should measure and disclose how many more fish are expected to survive and reproduce under one scenario as opposed to another. For example, if reverse flows in Old and Middle rivers are limited by other existing non-ESA regulations but not by additional measures under the ESA, what are the expected effects on population abundance? If additional restrictions on such flows are imposed under the ESA, what is the expected affect on abundance of listed species? Do other measures that do not involve restrictions on project operations, such as habitat restoration, offer greater promise of improving abundance? The results of these analyses may then be considered together with the other environmental consequences associated with various alternatives, including consequences related to differences in water supply. Such a comparison is essential to inform policymakers and the public regarding the choices to be made.

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It may be that despite more rigorous analysis than has been done before there will still be substantial scientific uncertainty regarding the likely environmental consequences of various alternatives. If so, that uncertainty should be expressly acknowledged. 40 C.F.R. § 1502.22. That, too, is important information for policymakers and the public. The existing biological opinions included specific prescriptions that were initially presented as if they were required by available science, but on closer examination were found to be based only on personal judgments. The -5,000 cfs limitation on Old and Middle river flows in the 2009 Salmonid BiOp is one example. The NEPA process here should make clear the differences between what is known based on the best available science, and where the appropriate decision makers must make policy judgments in the face of uncertainty.

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D. Proposed Action

Under the CEQ regulations, a notice of intent is supposed to briefly describe "the proposed action and possible alternatives." 40 C.F.R. § 1508.22. As discussed above, the NOI does not clearly identify a proposed action, nor any possible alternatives. Indeed, from the NOI it appears Reclamation has not yet decided upon a proposed action, or identified possible alternatives to the proposed action. This apparently reflects the still preliminary and incomplete ESA consultation. The NOI states only that "[t]he proposed action for the purposes of NEPA will consider operational components of the 2008 USFWS and the 2009 NMFS Reasonable and Prudent Alternatives." 77 Fed. Reg. at 18860.[7] But the NOI does not specifically identify which

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[7] An alternative, possible interpretation of this statement in the NOI is that Reclamation, FWS and NMFS have already decided they will again implement the reasonable and prudent alternatives in the existing biological opinions, and intend to do only perfunctory NEPA analysis and ESA section 7 consultation. That approach would violate NEPA and the ESA, and raise serious issues regarding compliance with the district court's orders. The

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of the "operational components" from those biological opinions Reclamation has in mind, except that it will "analyze" "flow management actions" "resulting from" those biological opinions. The NOI does not identify possible alternatives to those components at all. The lack of specific information in the NOI regarding the proposed action and possible alternatives limits the ability of the Public Water Agencies to provide responsive comments here. When and if Reclamation provides specific information on those topics, the Public Water Agencies request that Reclamation provide them an opportunity to provide additional comment.

The NEPA Handbook provides that "[t]he proposed action should be defined in terms of the Federal decision to be made. When the proposed action is related to other actions—especially other Federal actions—a careful consideration of the independent value of the proposed action should be made. When the independence of the proposed action is not clear, it may be appropriate to expand the scope to include those other actions." NEPA Handbook at 8-6. Reclamation's decision regarding what it must do to comply with the ESA is closely related to the actions of FWS and NMFS in issuing new biological opinions regarding the effects of project operations on listed species. As a number of the Public Water Agencies have contended in the litigation, FWS and NMFS have a role and NEPA obligations here as well. Reclamation should at least consider defining the relevant Federal action subject to NEPA review to include the actions of FWS and NMFS in issuing the new biological opinions, as well as any role they reserve for themselves in implementing any measures imposed in the new biological opinions.

Components of the flawed existing biological opinions should not be included as part of the proposed action. First, Reclamation does not yet know the outcome of reconsultation, and should not presume at this point that *any* reasonable and prudent alternatives are needed to avoid jeopardizing the continued existence of listed species or the adverse modification of designated critical habitat. Furthermore, many of the specific components of the 2008 FWS and 2009 NMFS RPAs were found unlawful, and hence are poor candidates for inclusion in a proposed action. *See* Section III.D, below (discussing rejected RPA components). It may be appropriate to include some elements of the RPAs in the existing BiOps in potential alternatives for discussion and analysis, but the arbitrary and illegal nature of those measures would provide a sound basis for rejecting them. The NOI states that the "proposed action will not consider" alternatives "that would require future studies." However, NEPA requires new studies where the available information is incomplete, unless the agency can make specific findings of exorbitant cost and infeasibility. 40 C.F.R. § 1502.22.

The Public Water Agencies submit that a scientifically rigorous analysis of the effects of CVP and SWP operations would likely conclude that those operations do not jeopardize the listed species or adversely modify their critical habitat. Accordingly, the Public Water Agencies suggest that for NEPA review Reclamation define the proposed action as the continued operation of the projects, including existing valid regulatory requirements, subject to lawful requirements of the incidental take statements in new biological opinions, without major changes to project operations imposed under the ESA. That proposed action, measured in comparison to the no action alternative, should have only modest environmental impacts. That proposed action would also meet the purpose and need described above. Ultimately, of course, Reclamation's decision

comments in this letter presume that the federal agencies intend to follow the law and the court's orders, and these comments are intended to assist them in doing so.

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regarding the action necessary to meet its ESA obligations must be informed by the outcome of the pending reconsultations.

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E. Action Alternatives

The Public Water Agencies are also concerned about the type and range of alternatives that will be analyzed in the EIS(s). The alternatives analysis is the "linchpin" of an EIS. *Monroe County Conservation Council, Inc. v. Volpe*, 472 F.2d 693, 697 (2d Cir. 1972). In the alternatives analysis, federal agencies must "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources." 42 U.S.C. §§ 4332(2)(E); 4332(2)(C)(iii). Agencies must "rigorously explore and objectively evaluate all reasonable alternatives" and explain why any alternatives were eliminated from detailed consideration. 40 C.F.R. § 1502.14. Reasonable alternatives are those that are "technically and economically practical or feasible and meet the purpose and need of the proposed action." 43 C.F.R. § 46.420.

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According to its own policies, Reclamation must develop and assess appropriate and reasonable alternatives for actions that may significantly affect the environment, integrate the Endangered Species Act into its analyses, and use the best available environmental data, including acquiring additional appropriate and reasonable data to support its decisionmaking. Reclamation Manual Policy No. ENV P03 (1998) *available at* http://www.usbr.gov/recman/env/env-p03.pdf, last visited April 9, 2012. Determining which alternatives are to be considered and analyzed is vitally important in shaping the EIS, and the scope of alternatives is directly related to the underlying purpose and need for which the action is being proposed. 40 C.F.R. § 1502.13. It is the purpose and need for the proposed action that dictates what alternatives should be developed for analysis. *See League of Wilderness Defenders-Blue Mountain Diversity Project v. Bosworth*, 383 F. Supp. 2d 1285 (D. Or. 2005). The Department of Interior's Regulations for Implementation of NEPA explain that "[t]he range of alternatives includes those reasonable alternatives that meet the purpose and need of the proposed action, and address one or more significant issues related to the proposed action." 43 C.F.R. § 46.415.

Here, as discussed above, the purpose is to continue long-term operation of both the CVP and SWP in a manner that will serve the authorized purposes of the projects as fully as possible. Those purposes include supplying water to help meet the needs of 25 million people and 2 million acres of agricultural land. The need for the action arises from the difficulty both projects have had in serving the water supply and other purposes while complying with the ESA. The NOI appears focused on flow-related changes to project operations as the proposed action to be considered in the NEPA process. The Public Water Agencies urge Reclamation to consider measures that may benefit the survival and recovery of listed species that do not involve modifications to project operations. These alternative actions must be explored to ascertain whether any would serve the purpose and need by maintaining or benefitting populations of listed species while at the same time allowing adequate and reliable water supplies to be delivered by the CVP and SWP.

There have been numerous scientific developments since the BiOps and their RPAs were issued and overturned by court order. This new scientific understanding of the various stressors

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and means to alleviate their impacts on listed species must be evaluated as part of the best available environmental data for developing alternatives. Attached hereto as Exhibit B is a list of some of the recent scientific articles issued since the 2009 BiOp was released. These new data relate to NEPA's obligation to examine and fully analyze potential alternative actions, as well as to the ESA's requirement that the best available science be used.

Reclamation is required to rigorously explore a variety of alternatives. As stated, the alternatives should allow for adequate water deliveries and prevent significant impacts to public health and the human environment, and also explore various methods to sufficiently maintain and protect the listed species and their critical habitats. Thus, alternatives that simply focus on flow regimes or decreasing water exports would be inappropriately narrow. As the district court previously recognized, the RPAs in the remanded BiOps had serious failings, including whether their implementation led to a wasting of water supplies without providing measurable benefit to the species.

If the RPAs in the BiOps are going to be considered as alternatives in the process—an action the Public Water Agencies believe is flawed given the court's prior rejection of the RPAs—the environmental impacts associated with implementing those measures must be fully analyzed. The Public Water Agencies believe the better approach is for the new NEPA process to affirmatively recognize that many portions of the RPAs adopted in the prior BiOps were found to be fatally flawed and to not attempt to ignore the findings of the court by including the RPAs in the environmental analysis regardless of the court's determination. For example, in its decision to remand the FWS BiOp, the district court rejected, among other components of the delta smelt BiOp RPA, its regulation of Old and Middle River ("OMR") flows and setting a range of new OMR flow prescriptions in the RPA based on raw salvage values. Similarly, the court rejected the RPA's regulation of the location of fall X2 in above-average and wet water years due, among other reasons, to the misuse of DAYFLOW data with Calsim modeling output when setting the X2 location prescriptions. The court also rejected the BiOp's conclusions regarding indirect effects. MSJ Decision, *Delta Smelt Consolidated Cases* at pp. 219-25 (Dec. 14, 2010). Further, the court criticized the BiOp's failure to "justify or explain its attribution to Project operations adverse impacts caused by other stressors . . . [requiring] further consideration and explanation." *Id.* at p. 223.

NMFS's imposition of an RPA in the Salmonid BiOp was also fatally flawed, according to the district court. For example, the court rejected the RPA's flawed use of raw salvage for regulating OMR flows; criticized NMFS's "chronic and unsatisfactorily explained failure" to use lifecycle modeling approaches and its "inexplicable" management approach without considering aspects of its lifecycle that are impacted by ocean conditions and ocean harvest; rejected the RPA's imposition of a 4:1 San Joaquin River inflow-export ratio in RPA Action IV.2.1, the specific OMR flow prescriptions in Action IV.2.3, and the triggers imposed by Action IV.3. MSJ Decision, *Consolidated Salmonid Cases* at pp. 270-75 (Sept. 20, 2011). The court specifically noted that questionable and equivocal evidence supporting agency decisions to impose significant adverse consequences on the state's water supply should "not drive the formulation of an RPA." *Id.* at pp. 272-73.

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It follows from the above discussion that serious consideration should be given to discarding the old RPA actions altogether and replacing them with alternative actions that will both benefit listed species and reduce impacts to water exports. When selecting a range of alternatives for the new EIS, Reclamation should strongly consider alternatives that will reduce impacts to water exports, rely upon the best available science, and provide measurable and tangible benefits to the listed species. SLDMWA WWD SJRECWA 115 continued

Reclamation is required to consider "potentially reasonable alternatives beyond its own jurisdiction" and to consider "the jurisdictions of other agencies (Federal and otherwise) when determining what reasonable alternatives should be considered." NEPA Handbook at 8-9; 40 C.F.R. § 1502.14(c). Such alternatives may include actions within the jurisdiction of agencies such as the State Water Board and the Regional Water Quality Control Boards, to address water quality habitat stressors created by the discharge of pollutants and contaminants. Alternatives may also include actions within the jurisdiction of the California Department of Fish and Game and the Fish and Game Commission, to address predator stressors created by implementation and enforcement of the bass fishing regulations.

As described in detail below, many other factors should also be considered in formulating alternative actions to be evaluated as part of the NEPA process. At a minimum, the following factors should be evaluated. These factors could potentially constitute elements of alternative actions themselves, or they could be evaluated as mitigation measures that apply no matter what alternative is ultimately selected.

1. Alternatives For The Protection Of All Listed Fish Species In The Delta

General measures should be included as alternatives to decrease the need to rely on curtailing exports by the projects. For example, Reclamation should consider methods for reducing the populations or impacts of alien species/predator species, such as striped bass. (PPIC 2011, *Managing California's Water: From Conflict to Reconciliation*, p. 212.) Alternatives that regulate smaller water diversions, especially unscreened diversions, should also be considered. It would also be appropriate to evaluate alternatives that require and implement an alternative conveyance, and/or reduce toxic chemicals. (PPIC 2011, pp. 222-224.) The 2012 Natural Research Council Report, *Sustainable Water and Environmental Management in the California Bay-Delta*, for example, described potential measures for managing risks to Bay-Delta ecosystems from selenium, methyl-mercury, pesticides/herbicides, emerging chemicals, metals, and legacy organic contaminants and PAHs. (NRC 2012, p. 75.) SLDMWA WWD SJRECWA 116

2. Alternatives That Address Specific Concerns Related To The Delta Smelt

a. X2 Location Management Should Not Be Considered Because It Is Not A "Reasonable Alternative"

As a starting point for the alternatives analysis, the NOI implies that Reclamation will analyze flow management aspects of the 2008 FWS and 2009 NMFS BiOps and RPAs. FWS's effects analysis in the First Draft 2011 Formal ESA Consultation on the Proposed Coordinated Operations of the CVP and SWP, at pp. 285-290 (Dec. 2011), refers extensively to salinity and the low salinity zone ("LSZ") as a primary constituent element ("PCE") of delta smelt habitat. SLDMWA WWD SJRECWA 117

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However, the best available science shows—and the district court found—that such an approach dramatically overemphasizes the influence of the fall location of X2 on delta smelt survival, reproduction and abundance. *Id.* at pp. 279-83. As Reclamation is well aware, FWS's 2008 BiOp contained a fall action that involved regulating the location of X2 for purported benefits to the delta smelt that was overturned by the Court based upon a lack of supporting evidence. Continued efforts to defend the imposition of Fall X2 in the face of substantial testimony—some of it from the FWS and Reclamation witnesses themselves—indicating that the location of Fall X2 bears little relationship to the abundance of Delta smelt ultimately caused the Court to characterize the FWS's witnesses as "zealots."

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As further discussed in the document attached hereto as Exhibit C, the LSZ only weakly overlaps the delta smelt's habitat, which is comprised of a multitude of biotic and abiotic characteristics. In light of the analysis in Exhibit C as well as the thorough rejection of the Fall X2 Action by the Court, Reclamation should not commit to an inappropriate overemphasis of the LSZ's influence. Doing so would wrongly attribute impacts to the projects that only have a nominal effect on the species and lead to the selection of alternative measures for NEPA evaluation that waste water resources and have little or no benefit to the species. Moreover, as recognized by the court, the selection of measures that would impose substantial impacts on human health and the environment would be inconsistent with the water supply purpose of the projects.

b. Food Availability For Delta Smelt

Three recent life-cycle modeling studies (Maunder & Deriso 2011, MacNally et al. 2010, and Miller et al. 2012) found that food availability was a significant driver of delta smelt abundance. Consistent with these modeling efforts, the available scientific data from CDFG surveys show evidence that zooplankton food supplies for delta smelt are an important factor affecting the species' population dynamics. By contrast, these studies also show that the location of fall X2 and associated estimates of "abiotic habitat area" are not strong predictors of delta smelt population dynamics.

Food availability could be improved through alternatives that require: wetlands restoration, particularly salt marsh work, controlling ammonia discharges (Dugdale et al 2007) and nutrient inputs (i.e., total N inputs related to ammonium loading) rather than using flows to dilute the pollution; controlling the *Corbula amurensis* clam (NRC 2012, p. 70); controlling aquatic macrophytes; and/or controlling blooms of toxic cyanobacterium *Microcystis aeruginosa* (NRC 2012, p. 67.)

With respect to the *Corbula* clam, the infiltration of the clam into the Suisun Bay region since 1987 has caused major changes in the availability and composition of food sources in the LSZ. It has made Suisun Bay habitat less desirable, while the Cache Slough region—approximately 40 km away to the north and far removed from the LSZ's influence—has maintained important characteristics, such as higher turbidity and food availability, that facilitate spawning and rearing of delta smelt. Recent survey efforts have shown substantial year-round populations of delta smelt in the north Delta.

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c. A Combination Of Turbidity Conditions And Spring Flow Should Be Evaluated, Rather Than Just Focusing On OMR Flow Alone

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The best available scientific data also confirm that imposing OMR flow controls alone, without simultaneous consideration of other factors affecting species geographic location and abundance, is insufficient. For the protection of delta smelt, in particular, the correlation of normalized salvage as a function of both turbidity and OMR flow shows that during conditions of low turbidity (i.e., clear water), salvage rates are low even when OMR is highly negative. This may occur because delta smelt avoid open waters and mid-channel areas where they are subject to higher predation and other stressors.

Figure 1, below, shows a bubble plot of normalized salvage as a function of both turbidity and OMR flow performed by Dr. Rick Deriso (2012), where the size of the bubbles is proportional to the amount of observed daily normalized salvage—the bigger the bubble, the larger the percentage of the population salvaged. As seen in the figure, most of the larger normalized salvage events (i.e., larger bubbles) lie in the region that the data suggests would be avoided by using less restrictive OMR limits than are in the remanded delta smelt biological opinion (i.e., the events in the region below and to the right of the OMR trigger would be avoided). Periods when no salvage occurred (i.e., the red dots) generally tend to occur in much greater frequency above and to the left of the trigger line. Thus, the bubble plot shows that salvage is generally more rare above the trigger line, but occurs more frequently and with generally larger salvage events below the trigger line.

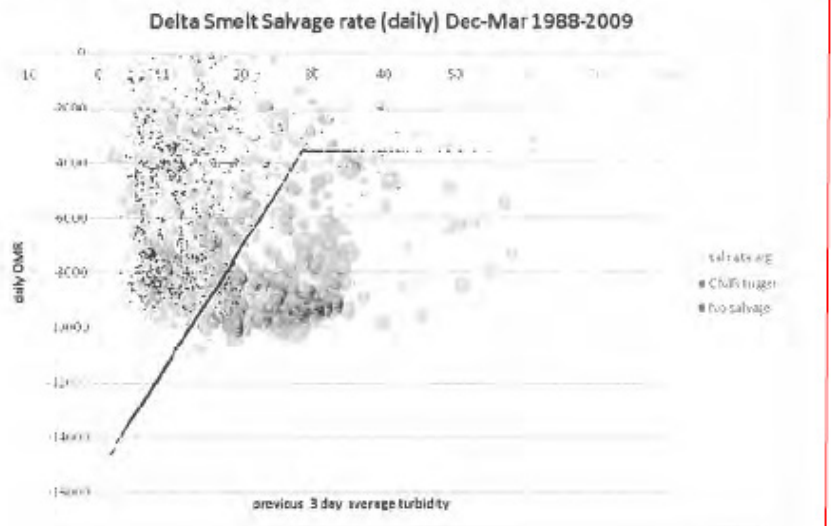

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Figure 1. OMR trigger (Y axis) as a function of prior three-day average turbidity (X-axis), along with observed daily normalized salvage (bubble size). Data is shown only if there are three previous days with turbidity estimates and it is restricted to days with negative daily OMR flow (for a total of 1880 days).

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Importantly, OMR flow controls imposed in a vacuum do not provide any particular benefit to the species. The best available scientific data show that OMR flows have application in reducing entrainment, when used in combination with turbidity triggers and normalized salvage. Based upon this information, consideration should be given in the NEPA process to evaluating the environmental effects of an alternative action to protect delta smelt based upon coupling normalized salvage, turbidity and flow regimes. Using this information, alternatives can be developed to provide for the lowest salvage at the lowest possible water cost. Another important question is whether entrainment has population level effects, and if so under what circumstances. Any restrictions on OMR to limit entrainment should be limited to circumstances where doing so is necessary to avoid meaningful population level effects.

3. Alternatives That Address Specific Concerns Related To Salmonids

a. Temperature Control

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Adequate temperatures need to be maintained for successful spawning, egg incubation, and fry development (between 42.5 and 57.5°F). (Salmonid MSJ Decision p.7, Doc. 633 (Sept. 20, 2011) (*Consol. Salmonid Cases*, 791 F. Supp. 2d 802 (E.D. Cal. 2011)); Salmonid BiOp p. 90, 93.) Temperature is one of the dominant factors affecting Salmonid populations. (Salmonid MSJ Decision p.58., Doc. 633 (2010).)

b. Recreational And Commercial Fishing

The potential effects on listed species of recreational and commercial fishing should also be very carefully evaluated. Ocean harvest is one of the dominant factors affecting Salmonid populations. (Salmonid MSJ Decision p.58, Doc. 633 (2010).) As noted by Judge Wanger, "It is inexplicable that these species are being managed in a piecemeal fashion, without considering all aspects of their life cycle in the same analysis, which would facilitate description of the true effect Project operations have on the species in light of other conditions. What population is available to be affected by Project operations is entirely relevant, as all Defendants have sought to attribute the species' decline to Project operations." (Salmonid MSJ Decision p.86, Doc. 633 (2010).)

c. Ocean Conditions

Ocean conditions directly tie into ocean survival of salmonids. The NRC has explained that "patterns in atmospheric temperature, wind, and precipitation drive ocean temperatures, mixing and currents, which in turn control growth and advection of plankton that provide food for salmon." (NRC 2012, p. 95 (citing Batchelder and Kashiwai, 2007).) Thus, an alternative that increases the diversity of wild and hatchery salmon ocean entrance timing would help ameliorate unfavorable ocean conditions. (NRC 2012, p. 107.)

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d. Competition From And Control Of Hatchery Fish

Additionally, an alternative should be included that addresses competition from and control of hatchery fish, because NMFS itself identifies hatchery effects as a major stressor contributing to the decline of Central Valley steelhead. (NRC 2012, p. 92; *see also* NRC 2012, p. 95; PFIC 2011, p. 221.)

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4. Green Sturgeon

Reclamation should also consider alternatives that address the green sturgeon population. Due to known temporal and spatial differences with salmonids, green sturgeon should be evaluated separately. To better understand these differences, more studies may be needed.

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Based on these factors, the Public Water Agencies suggest that Reclamation explore a broad suite of alternatives actions that will satisfy the agency's ESA obligations while also avoiding unnecessary limitations on the essential water supply operations of the SWP and CVP.

F. Mitigation Measures

In addition to analyzing the impacts of all potential, feasible alternatives, the EIS must include a discussion of the "means to mitigate adverse environmental impacts." 40 C.F.R. § 1502.16(h). Accordingly, the EIS must identify all relevant, reasonable mitigation measures that could alleviate a project's environmental effects, even if they entail actions that are outside the lead or cooperating agencies' jurisdiction. *See* "Forty Most Asked Questions Concerning CEQ's NEPA Regulations," No. 19b. Such measures must entail feasible, specific actions that could avoid impacts by eliminating certain actions; minimizing impacts by limiting their degree; rectifying impacts by repairing, rehabilitating or restoring the affected environment; reducing impacts through preservation or maintenance; and/or compensating for a project's impacts by replacing or providing substitute resources. 40 C.F.R. § 1508.20. Any environmental effects that may occur as a result of implementation of these mitigation measures must also be disclosed and analyzed.

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As with the identification and analysis of alternatives and project components, the development of mitigation measures has the potential to greatly reduce environmental impacts, including those to the listed species and other biota, which could result from some component of the various alternatives. Determining the precise impacts that project operations and the projects' components currently have on the listed species is vitally important; otherwise, mitigation measures (or alternative actions) may be imposed that will have additional environmental impacts but will not actually avoid, minimize, rectify, reduce, or compensate for the project's impacts. In addition, the effectiveness of any mitigation measures in reducing such impacts must be determined, as well as how much those impacts will be reduced by any particular mitigation measure. *See South Fork Band Council of Western Shoshone of Nevada v. U.S. Dept. of Interior*, 588 F.3d 718, 727 (9th Cir. 2009). Some of the actions discussed above in the section on alternatives could potentially also function as mitigation measures. Other types of mitigation measures, including restoration of habitat, could also be explored.

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V. EVALUATION OF POTENTIAL ENVIRONMENTAL IMPACTS OF ALTERNATIVES

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As discussed above, the potential environmental impacts associated with implementing each alternative must be evaluated in the EIS. Impacts occurring not only in the Delta and surrounding areas, but also in the service areas of water agencies that deliver Delta water to tens of millions of Californians and hundreds of thousands of acres of farmland must also be analyzed. As cooperating agencies representing member agencies that have first-hand knowledge of the impacts of reduced Delta water deliveries, the Public Water Agencies can provide some of the specific information that will be needed for this analysis. We include the following information as an overview of the types of impacts to be evaluated, and other critical considerations and information that must be included. Additional, more detailed descriptions of specific environmental impacts that should be evaluated, as well as supporting references, are provided in Exhibit D.

A. Impacts To Specific Resource Categories

1. Water Resources, Including Groundwater

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Given the value of and constraints on reliable water supplies in California, virtually any reduced deliveries of Delta water supplies to SWC and SLDMWA member agency service areas will have demonstrable, dramatic, and undeniable environmental impacts. Lower export water deliveries translate directly into water losses for urban and agricultural users. Such reduced deliveries compel greater reliance by retail agencies and their customers on groundwater to meet demand not only in dry years, but in other year types when greater exported water deliveries are currently anticipated. In turn, reduced exports and deliveries during more year types and in greater quantities diminish the ability of water managers to replenish and store groundwater when water is available to do so.

These circumstances can, and likely will, lead to additional groundwater overdraft (pumping beyond an aquifer's safe yield) throughout the Public Water Agencies' service areas, particularly in agricultural areas. Reduced groundwater levels can also lead to land subsidence that can additionally damage water conveyance facilities and other infrastructure, as has been documented throughout the state. For example, at the recent May 22, 2012 Scoping Meeting held in Los Banos, a speaker from the Central California Irrigation District stated that the District has spent $4.5 million to rehabilitate its conveyance facility, due to land subsidence resulting from groundwater overdraft and is involved in another $2.5 million program with Fresno County to study and replace a bridge damaged by land subsidence.

Reduced ability to replenish ground and surface water reserves also adversely impacts the ability of water purveyors to store water for dry years and emergencies. As just one example, reduced water storage can be expected to render southern and central California increasingly vulnerable to having insufficient supplies to suppress wildfires or sufficient supplies to survive a severe earthquake affecting conveyance facilities or other catastrophic events. Reduced exports of Delta waters also results in increased reliance by retail water users and their customers on other limited and lower quality supplies, such as recycled water, that need to be blended with SWP water to make them available for beneficial use. Finally, any impacts to the ability of the

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CVP and SWP to facilitate water transfers, including transfers of non-project water, should be addressed. For example, Reclamation must evaluate and disclose whether an alternative imposes additional operational constraints that limit (from "no action" conditions) the time or frequency when such transfers could be accomplished. These are just a few of the dozens of potential impacts to water resources that will result from reduced export and delivery of Delta water supplies to the SWP and CVP service areas.

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2. Land Use, Including Agriculture

Reduced SWP and CVP deliveries will result in significant changes in land use, particularly in agricultural landscapes. As dramatically shown during the 2007-2010 period, reduced export water deliveries can and will increase fallowing of land across the Central Valley and elsewhere. Reduced water supplies can also cause shifts toward planting permanent crops that have diminished ongoing water requirements, but which also require watering year-in and year-out, thus diminishing future flexibility in water budgeting by precluding management options such as annual crop-shifting or fallowing. Reduced supplies and lower quality water can also impact the production of certain crops, as well as the yield of crops that are grown. The unavailability of project water also increases the costs to obtain supplemental water. Lost exports also negatively impact water management plans that are produced by water agencies as source documents for evaluating land use projects. As imported water supplies become less reliable, establishing firm water supplies sufficient to meet land use planning requirements becomes more difficult.

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3. Socioeconomics

Reduced Delta water supplies also cause socioeconomic impacts. In response to reduced water supplies, farmers fallow fields and this reduced agricultural productivity results in layoffs, reduced hours for agricultural employees, and increased unemployment in agricultural communities. Reduced agricultural productivity also has socioeconomic impacts for agriculture-dependent businesses and industries. In addition, unavailability of stable and sufficient water supplies reduces farmers' ability to obtain financing, which results in employment losses, due to the reduced acreage of crops that can be planted and the corresponding reduction in the amount of farm labor needed for that reduced acreage. Reduced water supplies and the resulting employment losses also cause cascading socioeconomic impacts in affected communities, including increased poverty, hunger, and crime, along with dislocation of families and reduced revenues for local governments and schools. In the urban sector, reduced supplies or increased supply uncertainty can cause water rates to increase as agencies seek to remedy supply shortfalls by implementing measures to reduce demand or augment supplies. Connection fees and other one-time costs for new developments may also increase and further retard economic development.

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Some of personal and regional socioeconomic impacts of reduced water supplies, particularly to agriculture-dependent communities located on the westside of the San Joaquin Valley, were described by speakers at the May 22, 2012 Scoping Meeting held in Los Banos. At that meeting Congressman Costa described some of the socioeconomic impacts of the reduced water supplies resulting from the BiOps, stating:

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