Water Storage Investment Program
Frequently Asked Questions

The California Water Commission opened the application period for the Water Storage Investment Program on March 14, 2017, with applications due by August 14, 2017. In an effort to help applicants find answers to frequently asked questions, the Commission has compiled this document for easy reference.

Are storage tank projects eligible under WSIP?

Storage tanks can be eligible under WSIP. Both the definitions for Regional and Local Surface Storage projects allow for above ground artificial impoundments. The projects must also meet all Program requirements. The WSIP can pay for the following public benefits: ecosystem improvement, water quality improvement, flood control, emergency response, and recreation. Ecosystem improvements are tied to several different WSIP requirements such as:

- The project must provide measurable improvements to the Delta ecosystem or tributaries to the Delta.
- The value of ecosystem improvements must make up at least 50% of the total WSIP funding request.
- California Department of Fish and Wildlife must make a finding that the ecosystem benefits meet the requirements of Chapter 8 of Proposition 1.

Applicants are encouraged to read From Concept to Application – Considerations for Applicants to understand the WSIP requirements to determine whether to apply for the WSIP funding.

Does meadow restoration above a reservoir where the meadow would release cold water later in the season qualify as a conjunctive use project in WSIP?

No, the definition in section 6001(a)(15) of the regulations indicates that a conjunctive use project must provide coordinated and planned management of existing surface water and groundwater resources to maximize the efficient use of both resources. We interpret this to mean the ability to vary the use of either surface water or groundwater resources to provide project benefits in times when one of the sources is less available. Although valuable for water management, incorporation of restored meadows as described does not allow the degree of management and operational flexibility to meet the conjunctive use definition. Meadow restoration can still be a viable eligible project or project element under WSIP.

Would meadow restoration work meet the definition of capital cost?

Generally, tasks involved in meadow restoration seem to fit the definition of capital cost (see regulation section 6001(a)(11)). There may be project-specific

circumstances that would require a more detailed look and staff is willing to discuss any specifics further.

The application requirements seem to be rather difficult for a groundwater storage project. Is there a more streamlined application process for groundwater and small water storage projects?

The WSIP application requirements are tied to the regulations and statutory requirements in Chapter 8 of Proposition 1. These requirements apply to all water storage projects regardless of the size of the project. The level of analysis for monetizing physical benefits is commensurate with the magnitude of the benefits and the size of the project which may be applicable to small projects. Section 6004(a)(4) of the regulations allows applicants to select the appropriate level of analysis for monetizing the physical benefit depending on the magnitude of that benefit compared to the total magnitude of public and non-public physical benefits and the size of the project.

Would groundwater recharge basins that also serve as storm drainage detention/retention facilities qualify for WSIP funding?

Groundwater recharge basins that also serve as storm drainage detention and retention facilities could qualify for funding as a groundwater storage project or conjunctive use project depending on other project elements and claimed operations. Please be aware, there are requirements of WSIP that all projects regardless of eligible project type must meet to be eligible for funding. The WSIP can pay for the following public benefits associated with the storage project: ecosystem improvement, water quality improvement, flood control, emergency response, and recreation. Ecosystem improvements are tied to several different WSIP requirements such as:

- The project must provide measurable improvements to the Delta ecosystem or tributaries to the Delta.
- The value of ecosystem improvements must make up at least 50% of the total WSIP funding request.
- California Department of Fish and Wildlife must make a finding that the ecosystem benefits meet the requirements of Chapter 8 of Proposition 1.

Applicants are encouraged to read From Concept to Application – Considerations for Applicants to understand the WSIP requirements to determine whether to apply for the WSIP funding.

Is acquisition of land for a proposed project an eligible cost and if so, what are the requirements for acquisition of land for a project?

The WSIP (Proposition 1, Chapter 8) considers land acquisition to be part of the capital costs of a project. Requirements regarding land acquisition as a reimbursable cost or cost share are part of a funding agreement. The California Natural Resources Agency has a policy for land acquisition with State bond

funding. It requires a third party appraisal review by the Department of General Services to establish fair market value and consider the cost as cost share or as reimbursable cost.

How far outside the project footprint area does the benefits analysis need to consider?

The geographic scope of the project analysis must include any watershed(s) or regions(s) within the State that would affect or would be affected by the proposed project.

Is there a minimum required public benefit ratio?

There is no minimum value explicitly stated in the regulations. The Technical Reference states (page 8-1) that "the cost allocated to any public benefit must not exceed the dollar amount of that public benefit." Section 6004(a)(7)(A) of the regulations states "The total requested Program cost share is the ***portion of*** the public benefit cost shares allocated to the Program…" and lists four conditions that the requested cost share must satisfy. The emphasized phrase "portion of" means that requested funding cannot exceed the allocated cost share which in turn cannot exceed the dollar amount of the public benefit. As a result, the public benefit ratio cannot be less than one. The greater the ratio, the more competitive the project is for that scoring component.

Is the public benefit ratio always equal to 1?

No, we assume the public benefit ratio will generally exceed 1. Monetized public benefits are likely to exceed the capital costs allocated to public benefits. Also, if there are other funding sources for the public benefits, applicants may reduce the amount of funding requested from the WSIP, thereby increasing the public benefit ratio.

Are all three alternative costs methods (avoided cost, cost of alternative feasible means, and willingness to pay) required for monetization of each public and non-public benefit?

Section 6004(a)(4)(F) of the regulations requires that each of the methods be used if they are applicable to the project and to the public or non-public benefit being monetized. The monetization methodology in the regulations requires the applicant to use multiple methodologies to demonstrate they are not over estimating benefit values but using the minimum of the three methodologies. Where a method is not applicable, applicants should explain why it is not applicable for the reviewers' understanding and to demonstrate compliance with the requirement.

Is the net present value of projects used to compare projects?

Applicants are required to calculate the net present value of the project benefits in 2015 dollars. The net present value of the public benefits will then be used to

calculate the public benefit ratio, which is one of the scoring components. In addition, a positive overall net present value demonstrates economic feasibility, which is a component used to evaluate implementation risk (see section 6007(e) of the regulations).

How do you ensure assumptions for without-project conditions, for example economic conditions, are consistent among applicants?

The WSIP provides future climate conditions and CalSim-II and DSM2 model products for 2030 and 2070 without-project conditions for all applicants to help ensure consistency. These model products include assumptions of water operations, water use, laws, regulations, and compliance obligations of the State Water Project and Central Valley Project and climate and sea level conditions at 2030 and 2070. The WSIP does not specify all assumptions for economic conditions because it is not possible to know the future conditions in all potential project areas. It is the responsibility of the applicants to provide and justify these conditions. Section 2 of the Technical Reference provides lists of assumptions for regulatory requirements and conditions for Delta operations and water system operations. Additional sources of projections and assumptions on resource conditions, population, land use, and economic conditions are also provided in Section 2 and in specific subsections of Sections 4 and 5 of the Technical Reference, by resource area and benefit category.

Is a particular cost allocation method required?

No, the regulations do not require a particular cost allocation method. Section 8 of the Technical Reference provides criteria and examples of acceptable cost allocation methods.

If a project operation meets both an ecosystem benefit priority and a water quality benefit priority, can the applicant claim both an ecosystem and a water quality benefit?

No, the applicant should select which priority the benefit best fits. The applicant should keep in mind that the WSIP requires that ecosystem benefits must be at least 50% of the total requested WSIP funding for public benefits. Because of this requirement, the applicant may want to claim an ecosystem benefit instead of water quality benefit.

What should be assumed for the date of current conditions if a project has not started the environmental documentation?

The date of the current conditions is the date of the notice of preparation (NOP) for the environmental documentation. A publicly-available environmental document for the project is a WSIP basic eligibility requirement. If you do not have a NOP date, use the date of the publicly available environmental document.

Are applicants required to use the FEMA flood damage reduction method for quantifying flood control benefits?

Applicants are not required to use the FEMA method for flood control analysis. Applicants can quantify the flood control analysis using hydrologic and hydraulic modeling provided in their project's feasibility studies, new modeling using historical flood events or historical hydrology, or new modeling using the climate change hydrology data set provided by the WSIP. Section 5.4.3 of the Technical Reference describes methods for monetizing flood damage reduction benefits.

Are applicants required to update input data (ie. water demands, population forecasts) to the most current available information in model(s) used to quantify physical benefits?

Yes, section 6004(a)(1)(B) of the regulation requires the without-project future conditions be developed using the best available information on current conditions. In addition, if an analysis uses a population forecast in its calculations, section 6004(a)(4)(D) the regulation requires that the most current population forecasts published by the California Department of Finance must be used. The Technical Reference refers to an applicable current Urban Water Management Plan as a source for updated water demands.

Are applicants required to quantify all claimed public and non-public benefits with the required climate change data at 2030 and 2070?

Section 6004(a) of the regulation requires the analysis of all public and non-public benefits with the required climate change data at 2030 and 2070, except flood control. Section 6004(a)(1)(F) of the regulation provides additional allowances for quantification of flood control benefits.

What ecosystem priority or priorities should my project target?

The ecosystem priorities listed in Table 1 of the regulation are considered equally important and not listed in any rank order. Applicants should select a priority or priorities that can best be provided by their project and quantify the physical and monetized benefits based on the selected priority or priorities.

Is California WaterFix included in the without-project future conditions at 2030 and 2070?

California WaterFix is not permitted or under construction so it is not included in the without-project future conditions at 2030 and 2070 (regulation section 6004(a)(1)(B)) and is not included in the provided model products. Applicants should also review the uncertainty analysis, regulation section 6004(a)(8)(B), regarding future projects and water management actions.

Are all projects required to use the CalSim-II and DSM2 model products for quantified benefits within the Delta or resulting from Delta improvements even if the magnitude of the benefits is very small?

Section 6004(a)(1)(E) of the regulations requires all CALFED surface storage projects and all projects requesting funding for quantified benefits within the Delta or resulting from Delta improvements to use the CalSim-II and DSM2 model products to quantify the physical benefits regardless of the magnitude of the benefit.

For projects not located in the Delta watershed, what are analytical requirements to show measurable change in water made available through exchange operations and to show resulting measurable improvement in ecosystem conditions?

Each applicant must demonstrate with quantitative analysis how its project provides a measurable improvement to the Delta ecosystem or tributaries to the Delta through an exchange operation affecting water within the Delta watershed. Changes in Delta exports are key to any such projects in the Delta export areas of the State; therefore, CalSim-II modeling and additional analysis is required to demonstrate measurable improvements in Delta ecosystem.

What assurances are required for projects that use exchange operations to provide measurable improvement to the Delta ecosystem?

For projects not located within the Delta watershed, section 6003(a)(1)(L) of the regulations requires that the applicant must identify specific water rights or water contracts that would be created or amended to ensure measurable improvements to the Delta ecosystem. In addition, section 6003 (a)(1)(L) of the regulations also requires the applicant to provide supporting documentation of the affected parties' willingness to enter into such contracts or amendments, as well as an explanation of how these changes would assure measurable improvements to the Delta ecosystem.

Is any flow change “measurable” no matter how small? Could it produce a measurable ecosystem benefit?

It is the responsibility of the applicant to demonstrate that the change in flow results in measurable improvement to the Delta ecosystem or tributaries to the Delta. Depending on the ecosystem benefit claimed, demonstrating a measurable flow change may not be sufficient to demonstrate a measurable ecosystem improvement. Additional analysis may be required to demonstrate the change in flow will result in an ecosystem benefit. Section 4.7 of the Technical Reference describes concepts and methods for quantifying ecosystem improvements or impacts that could result from water storage projects.

Is the SWAP model version that Commission staff used to develop the unit water values (in Table D-4 of Appendix D to the Technical Reference) available for use by applicants?

Yes, both the model and the input files used to produce the estimates will be provided upon request. Note that proprietary software, the Generalized Algebraic Modeling System or GAMS, is required to run the model. The full version of GAMS and the CONOPT nonlinear solver are required. Several cautions are appropriate. First, the SWAP model requires expertise in order to apply it properly. Technical review of any SWAP analysis used in an application will be performed by expert users of SWAP. The review will assess the quality and appropriateness of SWAP analysis, per section 6007(b)(1)(A) of the regulation. Second, the water supply and other information used in the SWAP model are intended to represent general, regional conditions, and may not adequately represent a specific service area of a proposed project. Third, the sustainable pumping assumptions used to project 2070 agricultural water values are, as described in Appendix D of the Technical Reference, rough approximations because groundwater modeling of SGMA implementation is not yet available. Applicants may use the unit water values provided in the Technical Reference, but the use of these pumping assumptions for other purposes and analysis must be justified.

For projects that reduce their Delta exports through exchange operations and/or agreements with other entities to provide measurable improvements to the Delta ecosystem, who is responsible for preparing the CEQA document for the exchange operation?

It is the applicant's responsibility to define the total effect of their project, including the project's operations, how it provides measurable improvements to the Delta ecosystem, and the public benefits provided by the project. It is the responsibility of the applicant to analyze the project's operations, benefits and impacts in a CEQA document. Preparation of the CEQA document for the exchange operation should be decided between the entities participating in the exchange.

Can I delete and then replace attachments that I've uploaded on my application in the Grant Review and Tracking System (GranTS)?

Yes, select the Attachments link in your application and delete any attachments that have been uploaded. You can then go back to the appropriate tab in the application and upload new attachments. For more information about how to use the online GRanTS system, read the user guide or watch the video "How to Complete a Grant Application", both of which can be found at www.water.ca.gov/grants.

The regulations and Technical Reference requires applicants to quantify and monetize benefits at two points, 2030 and 2070. What if a project does not start operating until after 2030?

All projects must use the 2030 and 2070 conditions for consistency. The applicant should conduct analysis as though the proposed project will be built and operating at 2030 and 2070 and then interpolate results from those two future conditions to the first year of project operations and build the sequence of annual expected benefits for the actual planning horizon of the project by interpolation and extrapolation.

If impacts occur in a benefit category but the project does not provide that benefit to offset the impact, how is that impact accounted for? Must the impact be monetized and used to reduce eligible funding? For example, if a reservoir impacts existing river recreation but does not provide new recreation.

If no benefits are quantified and no funding requested for a public benefit category, the regulation provides no requirement that impacts in that benefit category be subtracted to determine eligible funding. For example, if recreation funding is requested and an impact to recreation is not fully mitigated, the unmitigated impact value would be subtracted from any recreation benefit when requesting funding for net recreation benefits. But if no funding is requested for recreation benefits, the regulation does not require that an impact to recreation be monetized. Physical impacts must nevertheless be described, per section 6004(a)(3)(B), "the applicant shall disclose and quantify, where possible, any impacts or negative effects." Significant impacts should be mitigated as identified in the CEQA analysis, and the cost of mitigation included in project costs.

Are the requirements and methods in the Technical Reference consistent with those for federal feasibility studies?

If an applicant has an existing federal (or other) feasibility study for the project proposed for WSIP funding, another feasibility study does not have to be performed as part of the WSIP application. Nor must the applicant revise its federal feasibility study. However, where WSIP asks applicants for information not covered in the federal feasibility study, an applicant needs to furnish that additional information as part of their WSIP application.

The WSIP application's feasibility requirements and methods are generally consistent with federal feasibility studies, specifically with the principles of benefits quantification and feasibility analysis found in the existing federal standards for benefit-cost analysis of water resource projects (the so-called National Economic Development Account for feasibility studies conducted by Reclamation and the U.S. Army Corps of Engineers). Some specific differences exist, such as the discount rate and accounting perspective (federal vs. state). Also, federal agencies may have adopted specific future conditions (such as climate and sea level) that

are different than those of the WSIP as stated in the regulations and Technical Reference. Applicants must explain any differences.

What is the requirement to demonstrate a project's financial feasibility?

Information in the Technical Reference Section 5, 7, and 11 may help an applicant determine specific information required to document that sufficient funding is available to the applicant to cover expected costs. Some or all of this information may already be covered in a project's existing feasibility study. More project-specific questions may be referred directly to Commission staff. However, staff cannot give any pre-approval to application components.

The Sustainable Groundwater Management Act (SGMA) is existing law, but exactly how it will be implemented, and therefore its effect, will vary by management area. Applicants cannot know those things at this time, so what assumptions should be used?

Section 4.4.4 of the Technical Reference provides some recommendations on consistency of an application with SGMA. Consistency with SGMA is part of the criteria that the State Water Board will use to determine the relative environmental value of a proposed project. Applicants may also use future unit water values provided in Section 5 of the Technical Reference that incorporate the effect of full implementation of SGMA's sustainable yield mandate.

Must all public benefits be quantified? And, must they all be monetized?

Public benefits paid for by the WSIP must be quantified, with the amount of the requested funding directly justified by monetized benefits, as required by section 6004 of the regulations. Public benefits must be quantified physically if they are counted as non-monetized benefits or if they are used to address one or more of the ecosystem or water quality priorities. Applicants need to read carefully the requirements for all of the eligibility and scoring criteria to determine the quantification requirements for their project's public benefits.

Are applicants required to use the unit values provided in the Technical Reference?

No, applicants are not required to use the unit values in the Technical Reference. The applicants must always justify the appropriateness of any water or fishery benefits analysis as it applies to their project. The unit values provided in the Technical Reference may be used by applicants to the extent they are applicable to the physical benefits quantified in an application. For example, the Technical Reference notes that the water unit values are not appropriate for water supply that decreases urban water shortage. Section 6007(b) of the regulations describes procedures for adjusting applicant's public benefit ratios. If applicants do not justify their use of alternative benefits analysis, staff may use the unit values in the Technical Reference to adjust the public benefit ratios.

How is the Expected Return for Public Investment different from the Public Benefit Ratio?

The Expected Return for Public Investment is the overall score considering all of the evaluation criteria (see section 6007(a) of the regulations). One of the criteria is the Public Benefit Ratio, the monetized public benefits divided by WSIP funding request.

Does the WSIP require that benefits be quantified by year type?

In general, physical benefits will vary by hydrologic condition and the analysis must include that. The required hydrologic data sets have such variable conditions. Section 4.2.1.4 of the Technical Reference states, "applicants must use a period of record that represents the range of variability and distribution of values observed in the full record." The analysis could use year types or another way of displaying variability in benefits over different hydrologic conditions. For monetizing benefits, the regulation states: "where applicable, monetized benefits shall consider how the dollar value of the physical benefits vary by the hydrologic conditions."

How should applicants account for differences in monetized values across locations and at different times?

When quantifying benefits, applicants are expected to account for location, timing (both within year and across years), and other important differences that affect the monetized value of physical benefits and the relative environmental value of ecosystem and water quality improvements. Unit values of water provided in the Technical Reference can be used by applicants, and provide an example of how economic value can account for timing and location differences. However, the Technical Reference cannot anticipate all possible projects and conditions. Therefore, applicants may develop and justify their own analysis. The technical review will evaluate the soundness and quality of that analysis.

Does the public benefit ratio (PBR) only consider the portion of benefits funded by the State? If another entity, say the federal government, provided some funding for a public benefit, would that raise the PBR?

All public benefits are counted in PBR, regardless of funding source. Therefore, if the federal government or another source funded some of the public benefits, that would not reduce the benefits (the numerator) in the calculation of PBR. Funding for public benefits from other sources could reduce the WSIP funding request (the denominator). Obtaining other funding to help pay for the public benefits would effectively raise the monetized PBR.

Is a sensitivity analysis required? Is it quantitative? How will it be used by the Commission in scoring and selection?

Section 6004 (a)(8) of the regulations requires an uncertainly analysis. It must consider climate change uncertainty, uncertainties of future projects, water management actions, and other sources of uncertainty identified by the applicant. The uncertainty analysis can be quantitative or qualitative. One of the evaluation criteria, Resiliency, will be scored based in part on the uncertainty analysis.

Some emergency response benefits would happen with very low probability of occurrence - how are those quantified? Does an emergency response benefit require dedicated storage?

The Technical Reference provides guidance on emergency response benefits. Local emergency events that have some basis for their likelihood (such as local drought or fire emergencies) should be assessed based on evidence of past occurrences in the project's study area. For extremely rare events, the Technical Reference (sections 4.11.2.1 and 4.11.2.2) provides a set of assumptions to use unless an applicant can justify other information. In any case, proposed commitments for providing emergency response water and hydrologic analysis of other water supply benefits should be consistent with assumed probabilities of occurrence.

A proposed project is not required to dedicate storage space or stored water in order to quantify this benefit. However, for whatever frequency or number of emergency events claimed, the applicant must quantify how the use of water for the emergency would impact the use and value of that water for other project benefits.

How do the methods described in the Technical Reference address the uncertainty of biological response to flow-related changes from a storage project?

Methods and models vary in how accurately they can estimate biological conditions related to water flow and quality. All of the models provided have achieved some level of acceptability among experts. In general, models can be used in a comparative analysis, where the model is not expected to estimate absolute conditions in the future, but rather is used to quantify the change between one condition and another (in our case, without-project versus with-project conditions). The comparison is the change (either a benefit or impact). The change, the difference between with and without-project conditions, is the main concern of the uncertainty analysis. The regulations and Technical Reference do not require applicants to run multiple models or sensitivity analyses to quantify the uncertainty in benefits. Rather, the regulations require applicants to describe how the project would perform under uncertainty about the future conditions.

The Application must include a project description (6003(a)(1)(B), which, from the Technical Reference (Section 3.3) must include "water storage evaporation loss or other losses as a function of time-of-year and area." What types of losses should be included?

The analysis should be from the State perspective, so this description of losses should include additional losses or gains to the State in the form of evaporation and other irrecoverable losses.

In the application on GRanTS, in the Physical Benefits Tab under Recreation Benefits, question 3 says to attach the recreation benefits but doesn't allow the applicant to upload a file. Where can I attach supporting documentation?

The application on GRanTS, as well as the Application Instructions, have been updated and question 3 now asks to describe the recreation physical benefits, rather than attach the recreation physical benefits. The question has also been updated to instruct the applicant to attach any supporting documentation in attachment 1, which immediately follows question 3.

How should future operations and maintenance (O&M) costs and other ineligible costs be handled in a cost allocation?

According to the regulations (6004(a)(7)(A)), public benefit cost shares for the five public benefit categories may be allocated to the State of California, the United States, local governments, or private interests. Some costs allocated to the public benefit categories will not be fundable by the Program. Specifically, costs that are not capital costs (defined in the regulations 6001(a)(11)) such as future O&M are not fundable by the Program. In addition, some capital costs allocated to public benefits may not be fundable because 1) funding for ecosystem benefits must be at least 50 percent of Program funding, and 2) the Program can fund up to 50 percent of capital costs except for conjunctive use and reservoir reoperation projects.

Nevertheless, applicants must show all costs over the planning horizon and indicate how they will be paid in order to show economic and financial feasibility. Applicants should identify one or more funding sources to pay for the costs allocated to public benefits that are ineligible for Program funding. Federal funding, non-WSIP state funding, and future recreation user-fees are examples. Applicants could also commit the beneficiaries of the project's non-public benefits to pay for some or all costs allocated to public benefits that cannot be funded by the Program. Such a commitment can be treated as a cost of realizing non-public benefits and may reduce the net non-public benefits used for cost allocation.

Section 6013 of the regulations requires applicants to provide a completed feasibility study, which would include demonstrating that all project costs are covered (financial feasibility), as a condition for receiving funding. Feasibility

studies completed without consideration of program funding may need to supply additional information to show WSIP funding and non-program funding of ineligible public benefit costs.

Is there a model available to estimate the amount of recreation visitation for surface water recreation?

Yes, a visitation model that estimates the total monthly visitation days and total monthly camping visits based on the reservoir and recreation characteristics is described in Section 5.4.5.2 and documented in Appendix F of the WSIP Technical Reference. The model may be appropriate for surface storage facilities with a surface area of more than 960 acres that allow power boating and have camping facilities. Visitation estimates should be constrained by capacity of facilities if the model suggests more visitation. A spreadsheet application of the recreation visitation model has been developed by Staff and is available upon request. Requests for the spreadsheet application of the recreation visitation model should be directed to cwc@water.ca.gov.

The Technical Reference (TR) provides a suggested willingness-to-pay (WTP) unit value for fall run chinook salmon of $2,500. In the Layton et al. (1999) study, WTP values were expressed as dollars per household per month. The TR calculations presumed the WTP values were dollars per household *per year*. Should the suggested unit value be changed, and can applicants use a different value?

An applicant has identified, based on the Layton et al. study, an alternate suggested unit value for fall run chinook salmon. Using the Layton et al. study alone, and with no other considerations, the implied unit value for fall run chinook salmon would be about $28,000 per escaping fish.

The TR Section 5.4.2.3 (Ecosystem Willingness to Pay) page 5-33 states,

> For ecosystem improvements quantified as increased numbers of non-listed fall-run Chinook salmon, a value of $2,500 per escaping fish per year may be used.

Staff does not find sufficient rationale to change the suggested value, because:

1. The WTP value also considered the use values from Helvoigt and Charlton (2009) as summarized in the TR page E-17; and
2. The scenarios considered by Layton et al. (1999) implied a wide range of WTP values per fish. The scenario considered in the TR focused on the smallest baseline population and percent increase, which resulted in the largest WTP value per fish. Although the small population numbers may be more consistent with likely California conditions, WTP estimates from surveys can be somewhat invariant with scale of improvement (see McFadden, 1994 and Hausman, 2012).

Therefore, the unit value of $2,500 remains an acceptable and reasonable WTP value for applicants to use, provided it can be justified as applied to their project.

Consistent with regulation section 6004(a)(4)(F)(3), applicants may use other methods of quantifying the WTP value for ecosystem benefits including increases in fall run chinook salmon. However, as for all benefits, applicants must also consider alternative costs when monetizing fall run chinook salmon benefits. As required by section 6004(a)(4)(G), monetized benefits other than avoided cost shall be calculated as the minimum of the feasible alternative cost value (if any) and the willingness to pay value (if any) consider alternative cost.

Most Central Valley fall run chinook are hatchery fish that have relatively low production costs. Proposed projects that are able to increase populations of naturally-spawning fall run chinook salmon may consider WTP and alternative costs that are different than those for hatchery fish. In particular, actions that increase natural spawning populations might be able to justify a higher unit value per fish for escapements that spawn naturally relative to those returning to hatcheries.

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