Chapter 32
Final EIS

On June 28, 2013, the U.S. Department of the Interior, Bureau of Reclamation (Reclamation), acting as the National Environmental Policy Act (NEPA) Lead Agency, released the Shasta Lake Water Resources Investigation (SLWRI) Draft Environmental Impact Statement (DEIS) for public review and comment. In compliance with NEPA, a Notice of Availability (NOA) was published by Reclamation in the Federal Register (Federal Register Vol. 78, No. 126, 39315) on Monday, July 1, 2013, and an associated NOA was published by the U.S. Environmental Protection Agency (EPA) in the Federal Register (Federal Register Vol. 78, No. 129, 40474) on Friday, July 5, 2013.

Reclamation conducted public involvement activities on the Environmental Impact Statement (EIS) during scoping and upon release of the DEIS. The scoping comment period and scoping meetings were held in October and November of 2005. Additionally, Reclamation held three public workshops and three public hearings during the comment period on the DEIS at the following locations in California:

- **Public Workshops** were held to provide an overview of the project and allow public comment and discussion:
  - Holiday Inn, Redding, California, July 16, 2013
  - Cal Expo Quality Inn Hotel & Suites, Sacramento, California, July 17, 2013
  - Merced County Fairgrounds, Los Banos, California, July 18, 2013
- **Public Hearings** were held to receive oral or written comments on the DEIS:
  - Holiday Inn, Redding, California, September 10, 2013
  - Cal Expo Quality Inn Hotel & Suites, Sacramento, California, September 11, 2013
  - Merced County Fairgrounds, Los Banos, California, September 12, 2013

Written and verbal comments were accepted at meetings and written comments were accepted throughout the comment period. The comment period on the DEIS began on July 1, 2013, and closed on September 30, 2013.

The public comments have been reviewed and, in accordance with NEPA Council on Environmental Quality (CEQ) Regulations, responses have been developed for all substantive comments, and revision of the DEIS has been made to clarify and enhance the text to produce this SLWRI Final EIS. This Final EIS consists of revised chapters 1 through 31, a new Chapter 32, "Final EIS," a new Chapter 33, "Public Comments and Responses," and revised and new appendices.

During the process of addressing public comments on the DEIS, some notable content changes were made in the Final EIS, including:

- Refinement of the project purpose statement
- Clarification of the relationship of this EIS and tiering to the CALFED Bay-Delta Program Programmatic Environmental Impact Statement/Environmental Impact Report
- Refinement of the operational scenarios focused on anadromous fish survival, and development, evaluation, and incorporation of Comprehensive Plan 4A (CP4A)
- Refinement of facility plans for recreation relocations, Shasta Dam modifications, Pit 7 Dam and Powerhouse modifications, and other reservoir area relocations (e.g., power transmission lines)
- Incorporation of updated resource information related to physical and biological resources in the primary study area
- Based on facility and construction footprints, refinement of "maximum" affected areas and refinement of "most likely" affected areas for biological resources
- In conjunction with an interagency, interdisciplinary team, refined and enhanced the mitigation measures, including development of a framework to quantify impacts (where appropriate) and establish mitigation ratios that were applicable to a number of impacts related to biological resources

32.1 Contents of the SLWRI Final EIS

The SLWRI Final EIS consists of:

- **Volume I**
  - Chapters 1 through 31
- **Volume II EIS**
  - Glossary Appendix
  - Plan Formulation Appendix
  - Engineering Summary Appendix
  - Modeling Appendix
  - Real Estate Appendix
  - Climate Change Modeling Appendix
  - Physical Resources Appendix
  - Biological Resources Appendix
  - Socioeconomics Appendix
  - Fish and Wildlife Coordination Act Recommendations for the Shasta Lake Water Resources Investigation Appendix
- **Volume III – Responses to Comments on DEIS**
  - Chapter 32 – Final EIS
  - Chapter 33 – Public Comments and Responses
  - Preliminary Environmental Commitments and Mitigation Plan Appendix
  - Duplicate DEIS Public Comments Appendix
  - Traffic Noise Modeling Appendix

32.2 Public Involvement for the SLWRI EIS

A variety of public involvement activities were conducted for the SLWRI EIS and are described below.

32.2.1 Scoping

Reclamation initiated the scoping process by publishing a Notice of Intent (NOI) to prepare an EIS and a notice of public scoping meetings pursuant to NEPA on Friday, October 7, 2005, in the Federal Register (Federal Register, Vol. 70, No. 194, 58744). The opportunity for submitting written comments on the NOI extended through December 6, 2005.

On the same day that the NOI and notice of meetings were published in the Federal Register, Reclamation announced the scoping meetings to be held in a news release posted on the project Web site and distributed via e-mail to media in the extended study area. The release was also distributed to agencies, stakeholders, organizations, and other interested parties. A second news release on October 20, 2005, announced an additional scoping meeting to be held in Red Bluff, and was published in display advertisements that Reclamation purchased in newspapers within the immediate study area in Redding, Red Bluff, and Dunsmuir, California.

In October and November of 2005, seven public scoping meetings were conducted in an "open house" format throughout California to update the public on the status of the proposed action and to solicit and receive input on alternatives, project related concerns, and issues to be addressed in the environmental review process. The scoping meetings were held in the following locations: Concord, Dunsmuir, Fresno, Los Angeles, Red Bluff, Redding, and Sacramento.

32.2.2 Release of the DEIS

The DEIS was released to the public for review and comment on Friday, June 28, 2013. As noted above, a NOA was published by Reclamation in the Federal Register (Federal Register, Vol. 78, No. 126, 39315) on Monday, July 1, 2013, and an associated NOA was published by EPA in the Federal Register (Federal Register Vol. 78, No. 129, 40474) on Friday, July 5, 2013.

Newspaper advertisements providing the dates and locations of the public hearings for the DEIS were published in the following newspapers on September 4, 2013:

- Los Banos Enterprise Record, Los Banos, California.
- Redding Record Searchlight, Redding, California.
- Sacramento Bee, Sacramento, California.

- Siskiyou Daily News, Yreka, California.

Reclamation also issued two news releases to its statewide media database notifying the public of the availability of the DEIS and the intent to hold public workshops. The news releases were distributed on June 28, 2013, and August 30, 2013.

During the comment period on the DEIS, Reclamation held three public workshops and three public hearings. (Dates and locations are presented at the beginning of this chapter.) Written and verbal comments were accepted at meetings and written comments were accepted throughout the comment period.

More than 5,000 comments were received, including written comments submitted during the comment period and verbal and written comments submitted at the meetings. Comments were received from elected officials; federal, state, and tribal governments; regional and local governments and agencies; special interest groups, and individuals. These comments were considered during development of the Final EIS.

32.2.3 Release of the Final EIS

A NOA of the Final EIS was placed in the Federal Register according to NEPA requirements and a press release was issued.

32.3 Executive Summary

The Executive Summary of the DEIS has been revised. The revised Executive Summary provides an overview of the SLWRI EIS, including the purpose and need/project objectives, project description, regulatory requirements, environmental consequences/environmental impacts, and the proposed environmental commitments/mitigation measures. The revised Executive Summary is presented at the beginning of this Final EIS.

32.4 Preferred Alternative and Rationale for Selection

NEPA guidelines (Title 40, Code of Federal Regulations (CFR) Section 1502.14(e) (40 CFR 1502.14(e))) require that the DEIS “identify the agency's preferred alternative or alternatives, if one or more exists, in the draft statement and identify such alternative in the final statement unless another law prohibits the expression of such a preference.” The preferred alternative is the alternative which is believed to fulfill Reclamation’s statutory mission and responsibilities, giving consideration to economic, environmental, technical and other factors (CEQ 1981).

A plan recommending Federal action should be the plan that best addresses the targeted water resources problems considering public benefits relative to costs.

It is recognized that most of the activities pursued by the Federal Government will require assessing trade-offs by decision makers and that in many cases, the final decision will require judgment regarding the appropriate extent of monetized and nonmonetized effects.

NEPA CEQ Regulations require the identification of the alternative or alternatives that are environmentally preferable in the Record of Decision (ROD) (40 CFR 1505.2(b)). The environmentally preferable alternative generally refers to the alternative that would result in the fewest adverse effects to the biological and physical environment. It is also the alternative that would best protect, preserve, and enhance historic, cultural, and natural resources. Although this environmentally preferable alternative must be identified in the ROD, it need not be selected for implementation. For the purposes of NEPA, an environmentally preferable alternative will be identified in the ROD associated with this EIS.

The preferred alternative has been identified in this Final EIS in consideration of public, stakeholder, and agency comments on the DEIS. The alternative recommended for implementation may or may not be identified as the "Environmentally Preferable Alternative" consistent with NEPA, the "Least Environmentally Damaging Practicable Alternative" consistent with the CWA, and the "Environmentally Superior Alternative" consistent with CEQA.

Consistent with the above CEQ Regulations and NEPA guidelines, the preferred alternative for implementation has been identified in this Final EIS, as described in the following section.

32.4.1 Preferred Alternative

Each of the action alternatives – CP1, CP2, CP3, CP4, CP4A, and CP5 – includes enlarging Shasta Dam and Reservoir and a variety of management measures to address, in varying degrees, all of the project objectives. The major benefits of the action alternatives are summarized in Table 2-25, and the impacts and mitigation measures are summarized in Table S-3. The cost estimates are presented in the Engineering Summary Appendix, Attachment 1, "Cost Estimates for Comprehensive Plans."

In the action alternatives, dam raises of three different heights were evaluated – 6.5 feet, 12.5 feet, and 18.5 feet. While all action alternatives provide primary and secondary project benefits (to varying degrees), the overall benefits of an 18.5-foot raise (CP3, CP4, CP4A, or CP5) were found to be greater than those of either a 6.5-foot raise (CP1) or 12.5-foot raise (CP2). Therefore, only the 18.5-foot raise action alternatives were retained as possibilities for the preferred alternative. For example, the additional reservoir storage would increase from 256,000 acre-feet with the 6.5-foot raise to 634,000 acre-feet with the 18.5-foot raise – nearly 2.5 times the additional reservoir storage of the 6.5-foot raise for between 15-25 percent greater construction costs. This additional reservoir

storage space would support both water supply reliability and fisheries objectives.

Reservoir operations and the resulting benefits were the differentiators amongst the 18.5-foot raise action alternatives (CP3, CP4, CP4A, or CP5). For example, CP3 would maximize agricultural water supply reliability, but would be the least beneficial to fisheries of the 18.5-foot raises. CP4 would provide the best opportunity to address anadromous fish survival in the upper Sacramento River; however, CP4 would provide the lowest benefits to water supply reliability.

Below is a summary of each action alternative weighed by Reclamation during the selection of a preferred alternative.

- CP1, formulated to address both anadromous fish survival and water supply reliability, would result in the lowest benefits of all of the action alternatives. Greater project benefits should be realized with higher dam raises for relatively low increases in costs. Therefore, CP1 was not selected as the preferred alternative.

- CP2, formulated to address both anadromous fish survival and water supply reliability, would have relatively low benefits when compared to the other action alternatives. Greater project benefits should be realized with higher dam raises for relatively low increases in costs. Therefore, CP2 was not selected as the preferred alternative.

- CP3, formulated to address both agricultural water supply reliability and anadromous fish survival, would greatly increase agricultural water supply reliability. However, CP3 would have no M&I water supply benefits and very low anadromous fish survival benefits when compared to the other 18.5-foot raises. Therefore, CP3 was not selected as the preferred alternative.

- CP5, formulated as a combination plan focusing on all objectives, would greatly increase water supply reliability. However, CP5 would have relatively low increased anadromous fish survival benefits in comparison with all other 18.5-foot raises. Therefore, CP5 was not selected as the preferred alternative.

- CP4, formulated to focus on anadromous fish survival while increasing water supply reliability, would have the highest increase in anadromous fish survival of all of the alternatives, and the lowest increase in water supply reliability (equal to CP1) compared to all of the considered alternatives (equal to CP1). CP4 would not best meet both of the primary objectives; water supply reliability would be compromised for increased anadromous fish survival. Therefore, CP4 was not selected as the preferred alternative. However, the evaluation of CP4 did indicate that refinements of operations could be made to optimize the amount of

water supply targeted for anadromous fish survival and water supply reliability such that both primary objectives could be substantially achieved with an 18.5-foot raise. This evaluation provided the impetus for Reclamation to develop CP4A, which performs better at simultaneously meeting both the anadromous fish survival and water reliability primary objectives.

CP4A would best balance and meet both of the primary objectives. CP4A, formulated to address both anadromous fish survival and water supply reliability, would provide relatively high increases in water supply reliability (equal to CP2) and the second highest increase in anadromous fish survival of all of the alternatives. CP4A would have the ability to meet the secondary project objectives, which were considered to the extent possible through pursuit of the primary project objectives. Secondary objectives include ecosystem enhancement, flood damage reduction, improved Delta water quality, increased hydropower generation and increased recreation. As an 18.5-foot raise, CP4A would best maximize benefits relative to costs. For these reasons, CP4A is the preferred alternative.

32.5 Consultation and Coordination

Chapter 27 of the EIS provides a description of all consultation and coordination that occurred during development of the SLWRI EIS.

32.6 Document Availability and Distribution

This section describes where the Final EIS is available for viewing by the public, and a list of agencies and individuals who received a copy of the Final EIS or a notice of its availability.

32.6.1 Document Availability

Hard copies of this document are available to view at the libraries and Federal and State Agency offices listed below. An electronic version of the document can be viewed on Reclamation's SLWRI Web site: http://www.usbr.gov/mp/slwri.

To request an electronic copy on compact disk of the Final EIS, please contact the Lead Agency representative:

Katrina Chow, Project Manager
Bureau of Reclamation, Planning Division
2800 Cottage Way
Sacramento, California 95825-1893
Email: BOR-MPR-SLWRI@usbr.gov
Fax: 916-978-5094

Libraries and Federal and State Agencies

Hard copies of the Final EIS are available for public viewing at the libraries and Federal and State agencies at the following locations:

U.S. Department of the Interior, Bureau of Reclamation Library
2800 Cottage Way
Sacramento, California 95825

Bureau of Reclamation, Northern California Area Office
16349 Shasta Dam Boulevard
Shasta Lake, CA 96019

U.S. Department of the Interior, Natural Resources Library
1849 C Street NW, Main Interior Building
Washington, D.C., 20240

Dunsmuir Branch Library
5714 Dunsmuir Avenue
Dunsmuir, California 96025

Shasta County Public Library,
Redding Library
1100 Parkview Avenue
Redding, California 96001

Kern County Library,
Holloway-Gonzales Branch
506 East Brundage Lane
Bakersfield, California 93307

Concord Library
2900 Salvio Street
Concord, California 94519

Los Banos Public Library
1312 South 7th Street
Los Banos, California 93635

Napa City-County Library
580 Coombs Stree
Napa, California 94559

Web Site

An electronic version of this Final EIS is available on Reclamation's Web site: http://www.usbr.gov/mp/slwri.

32.6.2 Distribution List

Elected officials and representatives, government agencies, private organizations, businesses, and individual members of the public have received a copy of this Final EIS or a notification of document availability. This section presents the distribution list of the Final EIS.

Federal Agencies

- U.S. Army Corps of Engineers
- U.S. Department of Interior, Fish and Wildlife Service
- U.S. Department of Interior, Bureau of Indian Affairs
- U.S. Department of Interior, Bureau of Land Management
- U.S. Department of Agriculture, Forest Service
- U.S. Department of Commerce, National Marine Fisheries Service
- U.S. Environmental Protection Agency

State Agencies

- California Water Commission
- California Department of Boating and Waterways
- California Department of Conservation
- California Department of Education
- California Department of Fish and Wildlife
- California Department of Public Health
- California Department of Parks and Recreation
- California Department of Toxic Substances Control
- California Department of Transportation
- California Department of Water Resources
- California Department of Food and Agriculture
- California Department of Forestry and Fire Protection
- California Environmental Protection Agency

- California Highway Patrol
- California Air Resources Board
- California Central Valley Flood Protection Board
- Central Valley Regional Water Quality Control Board
- California Governor's Office of Planning and Research
- State Water Resources Control Board
- California Energy Commission
- Delta Protection Commission
- Delta Stewardship Council
- Native American Heritage Commission
- State Lands Commission
- Office of Historic Preservation

Regional and Local Entities

- Shasta County
- Tehama County
- Siskiyou County
- Trinity County
- Shasta County Air Quality Management District
- Tehama County Air Quality Management District
- City of Anderson
- City of Corning
- City of Dunsmuir
- City of Mount Shasta
- City of Redding
- City of Red Bluff

- City of Shasta Lake

Federally Recognized Tribes

- Grindstone Indian Rancheria
- Paskenta Band of Nomlaki Indians
- Pit River Environmental Council
- Pit River Tribe of California
- Redding Rancheria

Other Interested Parties

- More than 250 non-governmental organizations representing environmental, agricultural, business, tribal, and related interests
- More than 50 water districts, irrigation districts, other water purveyors, and related utilities
- More than 50 media outlets
- More than 180 private business interests
- More than 1,000 individuals, including reservoir area property owners

32.7 Next Steps

Reclamation posted the Final EIS at http://www.usbr.gov/mp/slwri for public review and issued a notice in the Federal Register and press release describing the public release of the Final EIS. Also, elected officials and representatives, government agencies, private organizations, businesses, and individual members of the public on the mailing list have received a copy of this document or a notification of document availability.

The Final EIS and Final Feasibility Report will be used together to support the Federal decision. Typically a ROD is the final step in the NEPA process and would document any decision on which actions, if any, to take to address the primary objectives.

The Final EIS, Final Feasibility Report, and supporting documents will be submitted by the Commissioner of Reclamation to the Secretary of the Interior. After review by the Office of Management and Budget, in accordance with Executive Order 12322, the Secretary will transmit a Final EIS and Final Feasibility Report to the U.S. Congress to determine the type and extent of Federal interest in enlarging Shasta Dam and Reservoir if a plan is recommended for implementation. The proposed project would be considered

for authorization by Congress and, if authorized, a separate appropriation authorization would be required. The project would be considered for inclusion in the President's budget based on (1) national priorities, (2) magnitude of the Federal commitment, (3) level of local support, (4) willingness of the non-Federal sponsor to fund its share of the project costs, and (5) budgetary constraints that may exist at the time of construction.

32.8 References

Council on Environmental Quality. 2009 (December). Draft Proposed National Objectives, Principles, and Standards for Water and Related Resources Implementation Studies. Executive Office of the President. Washington, D.C.

Council on Environmental Quality. 1981 (March). NEPA's Forty Most Asked Questions. Available: < http://ceq.hss.doe.gov/nepa/regs/40/40p3.htm>. Accessed March 15, 2014.

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Chapter 33
Public Comments and Responses

This chapter contains the comments received on the Draft Environmental Impact Statement (DEIS), and responses to those comments. More than 660 letters and 5,000 comments were received. Section 33.1 describes the format of the responses to comments. Section 33.2 presents a summary of the comments. Section 33.3 comprises of the Master Comment Responses (MCR). Section 33.4 contains a complete list of all agencies, organizations, and individuals who commented on the DEIS. Sections 33.5 through 33.13 present the written comment letters and e-mails received on the DEIS, as well as the responses, as follows:

- Section 33.5, Comments from Elected Officials and Responses
- Section 33.6, Comments from Federal Agencies and Responses
- Section 33.7, Comments from Tribes and Responses
- Section 33.8, Comments from State Agencies and Responses
- Section 33.9, Comments from Regional and Local Governments and Agencies and Responses
- Section 33.10, Comments from Special Interest Groups and Responses
- Section 33.11, Comments from Individuals and Responses
- Section 33.12, Comments from Public Hearings and Responses
- Section 33.13, Comments submitted after deadline

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33.1 Format of Comments and Responses

The order of the comments and responses is as listed above. Each comment in the comment letters was assigned a number, in sequential order (note that some letters may have more than one comment). The numbers were then combined with an abbreviation for each commenting entity. Responses to the comments follow the comment letter, and are also numbered, corresponding to the numbers assigned to comments in the letter.

Written responses are to describe the disposition of any significant environmental issues raised (e.g., revisions to the proposed project to mitigate anticipated impacts or objections) and provide a good faith, reasoned analysis in response. The range of responses includes clarifying the analysis in the DEIS, making factual corrections, pointing to sections of the Environmental Impact Statement (EIS) where the comment is addressed, explaining why certain comments do not warrant further response, or acknowledging the comment for consideration by the decision-making bodies. Comments that present opinions about the program unrelated to environmental issues or that raise issues unrelated either to the substance of the DEIS, or to environmental issues, are generally noted without a response. The National Environmental Policy Act (NEPA) lead agency is directed to "assess and consider comments, both individually and collectively" (Title 40, Code of Federal Regulations (CFR) Section 1503.4 (a) (40 CFR 1503.4(a))) and prepare a response to these concerns expressed during the comment period.

No comments were received on the DEIS that resulted in any new impacts, required new mitigation, required consideration of new alternatives, or resulted in any other substantial changes to the DEIS. Changes made to the DEIS in response to comments were limited to minor corrections of errors and omissions. This Final EIS meets NEPA requirements for responding to comments.

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33.2 Summary of Comments

U.S. Department of the Interior, Bureau of Reclamation (Reclamation) received more than 660 letters commenting on the DEIS from elected officials, Federal agencies, tribes, State of California (State) agencies, regional and local governments, special interest groups, and individuals. The comment letters contain more than 5,000 individual comments. Additionally, several duplicate form letters and duplicate comment letters were received. Those letters can be viewed in the Duplicate DEIS Public Comments Appendix to Final EIS.

In all cases, the comments and responses have not resulted in new environmental impacts or a substantial increase in the severity of an environmental impact, or create a feasible project alternative or mitigation measure that would clearly lessen environmental impacts. The comments and responses also have not changed the analysis or conclusions of the DEIS.

Key issue areas in comments include the following, each of which is addressed in MCRs:

- NEPA Compliance
- Air Quality
- Noise and Vibration
- Flood Management
- Road and Bridge Relocations
- Relationship to Bay Delta Conservation Plan (BDCP)
- Water Supply Reliability
- U.S. Department of Agriculture, Forest Service (USFS) Cabins
- Downstream Fisheries
- Environmental Impacts
- Technical Analysis
- Climate Change
- California Environmental Quality Act (CEQA) Compliance
- Costs versus Benefits
- Cost Estimates
- Fracking
- Comprehensive Mitigation
- Reservoir Area Hydrology
- Recreation
- Land Use
- Endangered Species Act
- Environmental Justice
- Transportation
- Central Valley Project Improvement Act (CVPIA)
- Alternatives Development
- Engineering and Design
- Cultural Recourses
- Water Rights
- Wild and Scenic Rivers
- Reservoir Evaporation
- Private Land Acquisition
- Utility Relocations
- Fish Passage
- Regional Economic Impacts
- Water Quality

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33.3 Master Comment Responses

Reclamation as the Federal lead agency under NEPA received more than 660 letters commenting on the DEIS for the Shasta Lake Water Resources Investigation (SLWRI), containing more than 5,000 individual comments. When there is significant public comment, NEPA allows lead agencies to summarize or consolidate responses to similar comments, as long as all substantive issues are represented.

Some comments on the DEIS were made frequently, demonstrating common concerns among those submitting written comments and those speaking at the public hearings. The array of similar comments about particular topics revealed different aspects of common issues. To present responses that address all aspects of these related comments, MCR were prepared for recurrent topics and themes that were raised in a number of comments on the DEIS. The MCRs provide a means of providing a broader context to the response than may be possible when making individual responses. In some cases, an individual comment may be answered by one or more of the MCRs. Note that there are some comment categories below where the numbering sequencing is not continuous. This represents a consolidation of topics during the response development process.

Table 33.3-1. Master Comment Responses by Category

National Environmental Policy Act (NEPA)	
Acronym	**Title**
NEPA-1	Sufficiency of EIS
NEPA-2	Cumulative Impacts
California Environmental Quality Act (CEQA)	
Acronym	**Title**
CEQA-1	CEQA Compliance
CEQA-2	CEQA Mitigation
Purpose and Need	
Acronym	**Title**
P&N-1	Purpose and Need and Objectives
Range of Alternatives	
Acronym	**Title**
ALTR-1	Range of Alternatives – General
Alternatives Development	
Acronym	**Title**
ALTD-1	Alternative Development – Water Supply Reliability
ALTD-2	Alternative Development – Anadromous Fish Survival

Table 33.3-1. Master Comment Responses by Category (contd.)

Alternative Selection	
Acronym	**Title**
ALTS-1	Alternative Selection
Air Quality and Climate Change	
Acronym	**Title**
AQ-1	Offsetting Greenhouse Gas Emissions with Increased Hydropower
AQ-2	Loss of Carbon Sequestration and Carbon Sequestration Potential
AQ-3	Potential for Greenhouse Gas Emissions Generated by the Decomposition of Soil and Vegetative Material in the Expanded Reservoir
AQ-4	Greenhouse Gas Emissions Associated with Cement Production
Costs vs. Benefits	
Acronym	**Title**
COST/BEN-1	Intent of EIS and Process to Determine Federal Interest
COST/BEN-2	Comments Related to the SLWRI Feasibility Report
COST/BEN-3	Increased Water Supply Reliability under Action Alternatives
COST/BEN-4	Non-monetary Benefits of Action Alternatives
COST/BEN-5	Potential Project Financing
Engineering and Design	
Acronym	**Title**
ENG-2	Borrow Materials
General	
Acronym	**Title**
GEN-1	Comment Included as Part of the Record
GEN-2	Unsubstantiated Information
GEN-4	Best Available Information
GEN-5	Some People Support Dam Raise and Others Oppose Dam Raise
GEN-7	Rules and Regulations for Water Operations under Action Alternatives
GEN-8	Public Outreach and Involvement
COMMENTPERIOD-1	Comment Period
MAILINGLIST-1	Addition to the Mailing List
Noise and Vibration	
Acronym	**Title**
NOISE-1	Traffic Noise Analysis
NOISE-2	Intermittent Single-Event Noise Levels from Trucks Passing Off-Site Sensitive Receptors
Cost Estimates	
Acronym	**Title**
COSTEST-1	Development of Cost Estimates
COSTEST-3	Costs for Marina Relocations
COSTEST-4	Procurement and Construction Contract Requirements

Table 33.3-1. Master Comment Responses by Category (contd.)

Cultural Resources	
Acronym	**Title**
CR-1	Potential Effects to Cultural Resources
CR-2	Federal Recognition
CR-3	Current Effects to Cultural Resources
CR-5	Environmental Justice
CR-6	United Nations Declaration on "The Rights of Indigenous Peoples"
CR-8	Native American Connection to Salmon
CR-11	Cultural Resources and NEPA
CR-12	Cultural Resources and CEQA
CR-13	Native American Graves Protection and Repatriation Act Process
CR-15	National Historic Preservation Act Section 106 Consultations
Flood Management	
Acronym	**Title**
FM-6	Effects to Downstream Flooding
Fracking	
Acronym	**Title**
FRACK-1	Water Supply Used for Fracking
Road and Bridge Relocations	
Acronym	**Title**
RBR-1	Access Across Shasta Dam
RBR-2	Reduced Public Access Around Shasta Lake
Water Rights	
Acronym	**Title**
WR-1	Water Rights
Comprehensive Mitigation	
Acronym	**Title**
CMS-1	EIS Mitigation Plan
McCloud River Public Resource Code/Fed W&S Eligibility	
Acronym	**Title**
WASR-1	Eligibility of the McCloud River as a Federal Wild and Scenic River
WASR-3	The Shasta-Trinity National Forest LRMP and Protection of the Eligibility of the McCloud River as a Wild and Scenic River
WASR-4	CRMP's Responsibilities to Maintain the Outstandingly Remarkable Values of the McCloud River
WASR-6	Protections of the Lower McCloud River as Identified in the California Public Resources Code, Section 5093.542
WASR-8	Effects to the eligibility of rivers for inclusion in the Federal Wild and Scenic River System
Relationship to BDCP	
Acronym	**Title**
BDCP-1	Relationship of the SLWRI to the Bay Delta Conservation Plan

Table 33.3-1. Master Comment Responses by Category (contd.)

Reservoir Area Hydrology	
Acronym	**Title**
RAH-1	Available Water to Fill an Enlarged Reservoir
RAH-2	Reservoir Surface Area with Reservoir Enlargement
RAH-3	Dry Year Effects to Reservoir Storage
RAH-4	Historic Operations vs. Simulated Operations Used for Alternatives Evaluations
Reservoir Evaporation	
Acronym	**Title**
RE-1	Reservoir Evaporation
Water Supply Reliability Benefits & Beneficiaries	
Acronym	**Title**
WSR-1	Water Supply Demands, Supplies, and Project Benefits
WSR-8	Action Alternatives Don't Meet All Water Demands
WSR-12	Increasing Water Supply Reliability under Action Alternatives
Recreation	
Acronym	**Title**
REC-1	Effects to Recreation at Shasta Lake
REC-2	Ground Surveys for Recreation Facilities
REC-3	Effects to Tourism at Shasta Lake
REC-4	Relocation of Recreation Facilities
REC-5	Relocation of Private Recreation Facilities onto Federal Lands
REC-9	Relationship Between Recreation and Shasta Lake Water Levels
Private Land Acquisition/Relocation	
Acronym	**Title**
PLAR-1	Effects to Private Residences and Businesses
PLAR-9	Maps and Additional Surveys of Private Parcels/Structures
PLAR-11	Inundation Zone/Reservoir Buffer
United States Forest Service (USFS) Cabins	
Acronym	**Title**
FSCABINS-1	USFS Recreational Residence Tract Cabins in Preliminary Draft EIS and Draft EIS
FSCABINS-2	USFS's Authority over Privately Owned Cabins on USFS Lands
FSCABINS-3	Relocation of Privately Owned Cabins on USFS Lands
FSCABINS-5	Comment and Objection Process for Draft USFS Decisions
FSCABINS-8	Inundation Zone/Reservoir Buffer
FSCABINS-9	Structure Surveys for USFS Cabins
Land Use	
Acronym	**Title**
LANDUSE-1	Relocation of Septic Systems and Leach Fields
	Utility Relocations
Acronym	**Title**
UR-1	Effects to Water and Wastewater Infrastructure around Shasta Lake

Table 33.3-1. Master Comment Responses by Category (contd.)

	Downstream Fisheries
Acronym	**Title**
DSFISH-1	SALMOD Model for Sacramento River Chinook Salmon
DSFISH-2	Fisheries Models and Tools
DSFISH-3	Fish Habitat Restoration
DSFISH-4	Maintaining Sacramento River Flows to Meet Fish Needs and Regulatory Requirements
DSFISH-5	Fish and Wildlife Coordination Act Report
DSFISH-6	Historic Dam Effects on Fisheries
DSFISH-8	National Marine Fisheries Service Recovery Plan, Anadromous Fish Restoration Program, Doubling Goals and Biological Opinions
DSFISH-9	Flow-Related Effects on Fish Species of Concern
DSFISH-10	Methodology for Evaluating Fisheries Effects
Endangered Species Act	
Acronym	**Title**
ESA-1	Compliance with the Endangered Species Act
Fish Passage	
Acronym	**Title**
FISHPASS-1	Fish Passage Above Shasta Dam
Environmental Impacts	
Acronym	**Title**
EI-1	Intent of NEPA Process is to Provide Fair and Full Discussion of Significant Environmental Impacts
EI-2	Potential Impacts to Bank Swallow and Bank Swallow Habitat
EI-3	Botanical Resources Effects Related to Flow Regimes
EI-4	Socioeconomic and Associated Indirect Environmental Effects
EI-7	Bay Delta Conservation Plan Too Speculative to Provide Meaningful Quantitative Cumulative Analysis in SLWRI EIS
Environmental Justice	
Acronym	**Title**
EJ-1	Potential Effects to Disadvantaged Communities
Regional Economic Impacts	
Acronym	**Title**
SOCIOECON-1	Socioeconomic Effects to Shasta Lake Vicinity
SOCIOECON-2	Effects on Short-term and Long-term Employment
Technical Analysis	
Acronym	**Title**
TA-1	Interrelationship Between Shasta Dam Operations, San Joaquin River Flows, and Delta Exports
Transportation	
Acronym	**Title**
TRANS-1	Potential Construction-Related Effects to Roadways and Traffic Congestion

Table 33.3-1. Master Comment Responses by Category (contd.)

Water Quality	
Acronym	**Title**
WQ-1	Remediation of Abandoned Mines in the Shasta Lake Area
Climate Change	
Acronym	**Title**
CC-1	Climate Change Uncertainty and Related Evaluations
CC-2	Climate Change Projections
CVPIA	
Acronym	**Title**
CVPIA-1	Central Valley Project Improvement Act Firm Level 2 and Incremental Level 4 Refuge Water Supplies

33.3.1 Master Comment Responses for NEPA

NEPA-1 – Sufficiency of EIS

Some commenters stated that the SLWRI DEIS is incomplete, deficient, or has substantial flaws and that Reclamation must prepare and recirculate a legally adequate EIS/Environmental Impact Report (EIR). Many of these comments were summary statements at the end of a comment letter or comment topic. If the comments, before the summary statement, contained specific information (e.g., relating to the range of alternatives), these comment are addressed either as an individual response and/or other by other Master Comment Responses. However, as to the general statement that the DEIS is incomplete, deficient, or has substantial flaws and that Reclamation must prepare and recirculate a legally adequate feasibility study and EIS/EIR, the response to these general comments is provided below. For information regarding CEQA sufficiency, please see Master Comment Response CEQA-1, "CEQA Compliance."

A draft EIS must satisfy to the fullest extent possible the requirements for a final EIS established in NEPA Section 102(2)(C). NEPA Section 102(2)(C) states "…all agencies of the Federal Government shall include in every recommendation or report on proposal for legislation and other major Federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on i) the environment impact of the proposed action, ii) any adverse environmental effects which cannot be avoided should the proposal be implemented, iii) alternatives to the proposed action, iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented." In addition, 40 CFR 1502.1, the NEPA regulations state that "[An EIS] shall provide a full and fair discussion of significant environmental impacts and shall inform decision makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment." In 40 CFR 1508.8(a,b), "Effects" are defined as "Direct effects, which are caused by the action and occur at the same time and place. Indirect effects, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems."

The SLWRI Final EIS satisfies NEPA, to the fullest extent possible, by providing a meaningful analysis of all issues relevant to the human

environment. This includes a full and fair discussion of significant environmental impacts, including reasonably foreseeable direct and indirect effects, (DEIS Chapters 4 through 25), those impacts which cannot be avoided (Chapter 26, "Other Required Disclosures"), a reasonable range of alternatives (Chapter 2, "Alternatives"), the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity and irreversible and irretrievable commitments of resources which would be involved in the proposed action (Chapter 26, "Other Required Disclosures"). See also Master Comment Response EI-1, "Intent of NEPA Process is to Provide Fair and Full Discussion of Significant Environmental Impacts."

In 40 CFR 1503.4(a), the NEPA regulations state "An agency preparing a final environmental impact statement shall assess and consider comments both individually and collectively, and shall respond by one or more of the means listed below, stating its response in the final statement. Possible responses are to: 1) modify alternatives including the proposed action, 2) develop and evaluate alternatives not previously given serious consideration by the agency, 3) supplement, improve, or modify its analyses, 4) make factual corrections, 5) explain why the comments do not warrant further agency response, citing the sources, authorities, or reasons which support the agency's position and, if appropriate, indicate those circumstances which would trigger agency reappraisal or further response."

The Final EIS responded to each comment submitted to Reclamation during the public comment period on the DEIS. These responses describe how a reasonable range of alternatives were developed for SLWRI (alternative development (water supply reliability and anadromous fish survival) (ALTD-1 and ALTD-2), purpose and need and objectives (P&N-1), range of alternatives (ALTR-1), and alternative selection (ALTS-1)). Factual corrections and clarifying language has been added to the Final EIS in response to comments, but no significant changes in effects or in the proposed action have been made, nor has significant new information or changes in circumstances been brought to light by commenters.

Reclamation has clarified that it is tiering to the CALFED Bay-Delta Program (CALFED) Programmatic Environmental Impact Statement/Environmental Impact Report (PEIS/R). Reclamation, a CALFED agency, is conducting the SLWRI in furtherance of and consistent with the 2000 CALFED Programmatic Record of Decision (ROD), and considered the CALFED PEIS/R process and effects analysis in developing the SLWRI DEIS (and now the Final EIS). In the DEIS, the alternatives screening criteria reflected decisions documented in the CALFED Programmatic ROD, implicitly relying on those priorities to set the bounds of the SLWRI analysis. The Final EIS now

explicitly clarifies that the CALFED Final PEIS/R formed some of the basis for developing the set of alternatives that were analyzed in the DEIS.

Although conditions have changed since the CALFED Programmatic ROD was issued in July 2000, the Bay-Delta problems for which the alternatives were formulated persist today. The purpose of CALFED was to develop and implement a long-term comprehensive plan that would restore ecological health and improve water management for beneficial uses of the Bay-Delta system. The goal of CALFED was to concurrently and comprehensively address problems of the Bay-Delta system within four critical resource categories: ecosystem quality, water quality, water supply reliability, and levee system integrity. Although conditions have changed in the system since 2000 and progress has been made towards the CALFED goals, the fundamental needs for which the CALFED alternatives were formulated to address are still relevant today. For example, unreliable water supply, declining fish and wildlife habitat, continuing water quality issues, and the levee system are still key concerns for the Bay-Delta system. Accordingly, there is no new information or substantially changed circumstances that require Reclamation to revisit the CALFED alternatives as the alternatives, analyses, and recommended actions remain relevant today.

For that reason, tiering to the CALFED PEIS/R does not alter the effects of the alternatives considered in this analysis nor does it change any information needed by a decision-maker to make a decision, it simply more clearly shows the connection between the CALFED Programmatic ROD and the current SLWRI analysis. Although the California State Court of Appeals questioned the validity of the CALFED PEIS/R and, thus, the CALFED agencies' ability to rely on it, the California Supreme Court ultimately upheld the validity of the CALFED PEIS/R and Programmatic ROD. *See In re Bay-Delta Programmatic Envtl. Impact Report Coordinated Proceedings*, 184 P.3d 709 (Cal. 2008). All challenges to the validity of the CALFED PEIS/R and Programmatic ROD in Federal court were dismissed. Consequently, there are no legal impediments to Reclamation relying on and tiering to the CALFED PEIS/R.

Section 1502.9 of the Council on Environmental Quality (CEQ) regulations states that an EIS must be supplemented if "(i) The agency makes substantial changes in the proposed action that are relevant to environmental concerns; or (ii) There are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts." The clarification that Reclamation is tiering to the CALFED PEIS/R is not a substantial change to the proposed action, and it does not affect the environmental consequences or concerns raised by the proposed action.

As discussed in Chapter 2, "Alternatives," Section 2.1.6 "Development and Refinement of Comprehensive Plans," a refined operation scenario, CP4A, was developed for the Final EIS based on comment on the DEIS for the anadromous fish focused plan.

The CEQ's "Forty Questions," explains that an alternative which is a minor variation on one of the alternatives discussed in the DEIS should be developed and evaluated, if it is reasonable, in the EIS. The CEQ's "Forty Questions," goes on to state "If it [the new alternative] is qualitatively within the spectrum of alternatives that were discussed in the draft, a supplemental draft will not be needed." And, "[t]he agency will fulfill its obligation by addressing that alternative in the final EIS."

The evaluation of CP4 indicated that refinements of operations could be made to optimize the amount of water supply targeted for anadromous fish survival and water supply reliability such that both primary objectives could be substantially achieved with a 18.5-foot raise. This evaluation provided the impetus for Reclamation to develop CP4A which performs better at simultaneously meeting both the anadromous fish survival and water reliability primary objectives.

As with CP1, CP2, CP3, CP4 and CP5, the affected environment and potential environmental consequences (short- and long-term impacts, direct and indirect impacts, mitigation measures, and cumulative impacts) that could result from implementing CP4A were discussed and evaluated in the Final EIS.

Based on the results of this evaluation, CP4A was determined to be qualitatively within the spectrum of alternatives that were discussed in the DEIS and, since CP4A it is a refined operational scenario for CP4, it is considered a minor variation. Therefore, Reclamation has fulfilled its obligation by addressing CP4A in the Final EIS.

In summary, neither of those changes nor any of the other changes to the Final EIS meet the thresholds set forth in CEQ Regulation 1502.9 for a supplemental statement.

NEPA-2 – Cumulative Impacts

Comments were received relating to the nature and adequacy of the SLWRI cumulative impacts analysis.

This MCR discusses the nature and design of the quantitative and qualitative cumulative impacts analysis conducted to assess impacts of the proposed project in combination with other past, present, and reasonably foreseeable actions occurring in the primary and extended study area. This MCR explains why the cumulative effect analysis in the Final EIS generally is compliant with NEPA.

CEQ regulation defines a cumulative impact as, "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" 40 CFR 1508.7. During the preparation of the SLWRI DEIS, Reclamation carefully considered how to treat various potential future actions and programs consistent with CEQ NEPA Regulation 40 CFR 1508.7. The SLWRI cumulative impacts analysis is intended to account for potential project impacts combined with the impacts of existing facilities, conditions, land uses, and reasonably foreseeable actions expected to occur in the study area on a qualitative or quantitative level.

Actions which are included in the SLWRI cumulative effects analysis quantitatively are those with current authorization, secured funding for design and construction, or environmental permitting and compliance activities that are substantially complete (Chapter 2, "Alternatives," Section 2, "No Action"). Other projects which do not meet those criteria, but may have past, present, or reasonably foreseeable cumulative impacts in combination with the proposed project are included in the cumulative impacts analysis qualitatively. Table 3-1 in Chapter 3, "Considerations for Describing Affected Environment and Environmental Consequences," of the Final EIS lists the projects considered within the impacts analysis quantitatively and qualitatively.

The discussion of cumulative impacts within each resource area (Chapters 4 through 25) focuses on significant and potentially significant cumulative impacts, and mitigation is identified where warranted for cumulative impacts. Quantitative cumulative effects for the No-Action are described in Chapter 2, "Alternatives," Section 2.2, "No-Action Alternative," and in the future with-project conditions for each action alternative. Essentially, the No-Action Alternative includes, in the future condition, those reasonably foreseeable actions that are included in the list of actions for the cumulative impact analysis, as does each of the action alternatives. Therefore, the "Direct and Indirect Effects" impacts assessments for future with-project conditions compared to the No-Action Alternative in each resource area chapter also serves as a quantitative cumulative impact assessment for each impact described, describing the incremental affect associated with the action alternatives. Clarifying text has been added to Chapters 3 through 25 to reflect this correlation.

Additionally, for the Final EIS, the No-Action/No-Project Alternative is based on Central Valley Project (CVP) and State Water Project (SWP) operational conditions described in the Reclamation 2008 Biological

Assessment on the Continued Long-Term Operations of the CVP and SWP (2008 Long-Term Operation BA), and the Biological Opinions (BO) issued by U.S. Department of the Interior, Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) in 2008 and 2009, respectively. The No-Action Alternative also includes key projects assumed to be in place and operating in the future, including the Freeport Regional Water Project, Delta Water Supply Project, South Bay Aqueduct Improvement and Enlargement Project, a functional equivalent of the Vernalis Adaptive Management Plan, full Restoration Flows under the San Joaquin River Restoration Program, and full implementation of the Grassland Bypass Project. Table 2-1 of the Modeling Appendix describes the existing condition, and shows which actions were assumed to be part of the future condition (or No-Action /No-Project Alternative) in the SLWRI 2012 Version CalSim-II model.

Cumulative impacts are also addressed qualitatively in the "Cumulative Effects" section of each resource area chapter to assess if potentially significant effects to a particular resource could exist due to a broader range of past, present, and reasonably foreseeable actions. The qualitative cumulative effects analysis in each resource area chapter considers the actions listed as qualitative in Table 3-1 in Chapter 3, "Considerations for Describing Affected Environment and Environmental Consequences."

Finally, and in compliance with Section 1502.20 of the CEQ regulations that implement NEPA, the analysis of cumulative effects tiers to the CALFED Final PEIS/R and the Programmatic ROD issued August 28, 2000. The analysis and assumptions in the CALFED Final PEIS/R and Programmatic ROD are applicable to SLWRI cumulative analysis. First, the analysis of cumulative impacts in the CALFED Final PEIS/R considered the long-term environmental impacts of the CALFED Preferred Program Alternative and alternatives, including those that would be less than significant, together with similar impacts of other projects. The CALFED Final PEIS/R and Programmatic ROD evaluated, at a programmatic level, five surface water storage projects to be pursued with project specific studies. These studies included Shasta Lake Enlargement, Los Vaqueros Reservoir Enlargement, Sites Reservoir, In-Delta Storage, and development of storage in the upper San Joaquin River Basin. The CALFED PEIS/R analysis of cumulative effects describes the effects of these storage projects with past, present, and reasonably foreseeable projects in the Delta region, Bay region, Sacramento River region, San Joaquin River region, and other SWP and CVP service areas. To that point, storage projects (e.g., Los Vaqueros Reservoir Enlargement) have proceeded as described in the CALFED Final PEIS/R while no other large storage projects have been implemented that were not described in the CALFED analysis. Second,

because CALFED actions affected a large geographic area over a 30-year time frame, this analysis of cumulative impacts, growth inducement, and area-wide impacts assessment builds upon the CALFED PEIS/R analysis of cumulative effects to include an updated analysis of reasonably foreseeable projects, recent and relevant BOs, and more specific information about the potential for the action alternatives to cause wide-ranging effects.

33.3.2 Master Comment Responses for CEQA

CEQA-1 – CEQA Compliance

Both NEPA's implementing regulations (40 CFR 1506.2) and CEQA Guidelines (Sections 15220 to 15229) encourage the development of joint NEPA/CEQA documents to the extent possible to reduce duplication, provide for better coordination and reduce resource needs. In California, many water resources development project sponsors prepare joint NEPA/CEQA documents with either Reclamation or U.S. Army Corps of Engineers (USACE) being the lead federal agency and the California Department of Water Resources (DWR) or local water agencies being the CEQA Lead Agency. During the preparation of the DEIS it was assumed that a State CEQA Lead Agency would be identified.

DEIS Chapter 1, "Introduction," states that "This document has also been prepared in accordance with the California Environmental Quality Act (CEQA) and could be used by State of California (State) permitting agencies that would be involved in reviewing and approving the project" (Page 1-1). However, at the time of publishing of the DEIS, a CEQA Lead Agency had not been identified. The CEQA Guidelines outline the process to determine the appropriate State Lead Agency in Section 15050-15053. In addition, CEQA Section 21067 defines the Lead Agency as the "public agency which has the principal responsibly for carrying out or approving a project which may have a significant effect upon the environment." Reclamation will be carrying out the "project" and at this time, it is not certain if there will be State or local agency approvals or funding involved in implementation.

As pointed out by several commenters, the DEIS, and possibly the Final EIS, may not be sufficient to serve as a Draft EIR (DEIR) for CEQA purposes and would require scrutiny by any State CEQA Lead Agency before release to the public as a DEIR. Section 15221 of the CEQA Guidelines states that when a NEPA document is ready before the CEQA document, the State Lead agency shall evaluate the NEPA document for CEQA compliance and augment the CEQA document with CEQA specific analysis, as necessary. The State Lead Agency, assuming one is identified in the future, would evaluate the legal sufficiency of all aspects of the document including range of

alternatives, impact assessments, mitigation measures, identification of an environmentally superior alternative, and effects to State protected resources including state-listed endangered and threatened species. For example, the EIS identifies impacts related to the California Public Resource Code Section 5093.542 which states that the wild trout fishery of the lower McCloud River should be protected and its free-flowing conditions should be maintained as described in Chapter 25, "Wild and Scenic River Considerations for McCloud River." Implementation of action alternatives described in the EIS would affect the wild trout fishery and free-flowing condition of up to an additional 3,550 feet of the lower McCloud River by inundating a portion of the lower McCloud River as identified in the California Public Resources Code, Section 5093.542. As more fully described in Master Comment Response WASR-6, "Protections of the Lower McCloud River as identified in the California Public Resources Code, Section 5093.542," NEPA obligates the Federal agency to disclose the consequences of the Federal action, which can include consideration of alternatives that may be inconsistent with existing State or Federal law.

Master Comment Response WASR-6, "Protections of the Lower McCloud River as Identified in the California Public Resources Code, Section 5093.542," also addresses the participation of state agencies with regards to the feasibility of enlargement of Shasta Dam.

Any CEQA process related to the SLWRI would require a Notice of Preparation and scoping process, consultation with State and local Responsible Agencies, identification of an Environmentally Superior Alternative, and public circulation of a DEIR in accordance with CEQA. Reclamation, as a federal agency evaluating a major Federal action, is not subject to CEQA and has no standing under California law to be the State CEQA Lead Agency. It is assumed that any CEQA Lead Agency would consider the scope of its reliance on the Final EIS for CEQA purposes. Reclamation is not making any judgment on the legal adequacy of the DEIS for CEQA compliance. Nor is Reclamation speculating on whether a State Lead Agency under CEQA will be identified, or what State or local agency might become the State Lead Agency.

Text has been revised in the Final EIS to further clarify that the document is not being published as a fully CEQA-compliant document.

CEQA-2 – CEQA Mitigation

Several commenters stated that some of the mitigation measures are vague, do not include performance measures or other standards that allow the reader to gauge the adequacy of mitigation, and defer any detail to future documents. In addition, there are comments that state that the failure to identify mitigation measures violates CEQA.

Under CEQA, mitigation includes avoiding, minimizing, rectifying, reducing over time, or compensating for an impact (Title 14, California Code of Regulations (CCR) Section 15370 (14 CCR 15370)). An EIR must describe feasible mitigation measures for significant adverse impacts (14 CCR 15126.4(a)(1)), and the agency must adopt mitigation measures or alternatives to substantially lessen the significant effect, if feasible, before approving the project (California Public Resource Code Sections 21002 and 21002.1).

NEPA defines mitigation in a similar way as CEQA (40 CFR 1508.20). If an agency does not adopt feasible mitigation measures in an EIS, it must justify its decision. If it does adopt mitigation measures, then it must put in place a mitigation monitoring and enforcement program and, where applicable, that program should be summarized in the ROD (40 CFR 1505.2(c)). The DEIS provided a discussion of reasonable and appropriate mitigation for identified impacts as required by NEPA and consistent with CEQA.

As stated in Master Comment Response CEQA-1, "CEQA Compliance," the State Lead Agency, assuming one is identified in the future, would evaluate the legal sufficiency of all aspects of the document for CEQA compliance, including the adequacy of mitigation measures. For additional information on the comprehensive mitigation strategy, see Master Comment Response CMS-1, "EIS Mitigation Plan."

33.3.3 Master Comment Response for Purpose and Need

P&N-1 – Purpose and Need and Objectives

Comments were received during the public comment period related to the SLWRI purpose and need and objectives and included suggested changes to the SLWRI purpose and need statement and/or objectives. In addition to the discussion below, please see Master Comment Response ALTR-1, "Range of Alternatives," which describes NEPA requirements for alternatives development, the relationship of SLWRI to CALFED, and development of the SLWRI alternatives. Also, please see Master Comment Responses ALTD-1, "Alternative Development – Water Supply Reliability," and Master Comment Response ALTD-2, "Alternative Development – Anadromous Fish Survival," related to measures considered during the plan formulation process to address water supply reliability and anadromous fish survival; and Master Comment Response ALTS-1 "Alternative Selection" for alternative selection (e.g., identification of the preferred alternative and Clean Water Act Section 404 compliance).

In 40 CFR 1502.13, the NEPA regulations state that an EIS "shall briefly specify the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action."

The "need" for action is the underlying problem the agency wants to fix or the opportunity to which the agency is responding with the action. The "purpose" is the goals or objectives that the agency is trying to achieve (Reclamation 2012).

Generally, Federal [a]gencies enjoy "considerable discretion" to define the purpose and need of a project. *Nat'l Parks & Conservation Ass'n (NPCA) v. BLM*, 606 F.3d 1058, 1070 (9th Cir. 2009) (citations omitted). "'[A]n agency cannot define its objectives in unreasonably narrow terms, 'such that 'only one alternative from among the environmentally benign ones in the agency's power would accomplish the goals of the agency's action.'" *Id*. (citations omitted). On the other hand, the purpose and need statement should not be so broad as to require analysis of alternatives that are inconsistent with the project's overarching purpose. *Northwest Ecosystem Alliance v. Rey*, 380 F.Supp.2d (W.D. Wash. 2005). An agency's statement of purpose must be reasonable. *The Protect Our Communities Foundation v. Salazar, 2013 U.S. Dist LEXIS 159281 (S.D. Cal. 2013)*(citing *NPCA*, 606 F.3d at 1070). In *Protect Our Communities*, 2013 U.S. Dist. LEXIS 59281, the district court rejected an argument that a Bureau of Land Management (BLM) purpose and need statement was too narrow because it focused on the goal of building a wind generation facility, as opposed to the broader goal of encouraging renewable energy development.

Chapter 1, "Introduction," Section 1.2, "Purpose and Need/Project Objectives," of the Final EIS defines the purpose and need and the project objectives for the SLWRI. The purpose statement in this Final EIS has been clarified, from the Draft EIS, to state, "*…to improve operational flexibility of the Sacramento-San Joaquin Delta (Delta) watershed system to meet specified primary and secondary project objectives."* The Final EIS Plan Formulation Appendix provides detailed background on the SLWRI study authorization, project need, and project objectives.

Influence of Study Authorization and CALFED Programmatic ROD on Project Purpose and Need and Objectives Development of the SLWRI, particularly the purpose and need and objectives, was conducted consistent with both the Federal authorizations for conducting feasibility studies, and the CALFED Programmatic ROD.

Study Authorization Reclamation was directed to study potential enlargement of Shasta Dam and Reservoir under two separate authorities. Public Law 96-375 (October 3, 1980) provided initial Federal authorization, allowing the U.S. Secretary of the Interior to:

> *…engage in feasibility studies relating to enlarging Shasta Dam and Reservoir, Central Valley Project, California or to the construction of a larger dam on the Sacramento River, California, to replace the present structure.*

Section 103(c), "Authorizations for Federal Activities under Applicable Law," of the CALFED Bay-Delta Authorization Act (Public Law 108-361, October 25, 2004), authorizes the U.S. Secretary of the Interior to carry out the activities described in paragraphs (1) through (10) of Subsection (d), which include:

> *...(1)(A)(i) planning and feasibility studies for projects to be pursued with project-specific study for enlargement of (1) the Shasta Dam in Shasta County.*

Also, Section 103(a)(1) of Public Law 108-361 (October 25, 2004) states:

> *The Record of Decision is approved as a general framework for addressing the CALFED Bay-Delta Program, including its components relating to water storage, ecosystem restoration, water supply reliability (including new firm yield), conveyance, water use efficiency, water quality, water transfers, watersheds, the Environmental Water Account, levee stability, governance, and science.*

CALFED Programmatic ROD Section 103(a)(1) of Public Law 108-361 was the direct result of the CALFED Programmatic ROD, a multi-agency planning process which was begun in 1995 to resolve conflicts between water supply and fish and wildlife resources in the Bay-Delta system. In 2000, the CALFED Final PEIS/R identified a list of twelve potential surface storage projects for consideration. In this document, SLWRI was identified as one of three surface storage projects to be pursued through a project-specific study to expand CVP storage by 300 thousand acre-feet to increase the pool of cold water available to maintain lower Sacramento River temperatures needed by certain fish and provide other water management benefits, such as water supply reliability. The SLWRI's primary and secondary objectives are derivative of those identified in the CALFED Programmatic ROD.

Project Purpose and Need and Objectives

Project Purpose The Project Purpose was revised for clarification in the Final EIS (Chapter 1, "Introduction," Section 1.2.1, "Project Purpose and Objectives") as follows:

> *…to improve operational flexibility of the Sacramento-San Joaquin Delta (Delta) watershed system to meet specified primary and secondary project objectives.*

The Project Purpose statement in the Final EIS was revised to reflect the fact that many measures/alternatives were considered in the plan formulation process other than measures that would modify or raise Shasta Dam. As explained in ALTR-1, "Range of Alternatives – General", the Final EIS was also revised to clarify that Reclamation not only considered the CALFED Final PEIS/R in analyzing the environmental impacts of the SLWRI, but that this EIS tiers to the CALFED Final PEIS/R. These revisions were primarily made in EIS Chapters 1, "Introduction," Chapter 2, "Alternatives," and Chapter 3, "Considerations for Describing Affected Environment and Environmental Consequences," and in Plan Formulation Appendix Chapter 2, "Management Measures."

The CALFED development process is also fully explained in ALTR-1, "Range of Alternatives – General." In developing the CALFED Final PEIS/R, the CALFED agencies, including Reclamation, evaluated a broad range of water management options (with and without storage) to be implemented to achieve the CALFED goals. Numerous alternatives were considered for improving ecosystem quality and water supply reliability as well as water quality and levee system integrity. Many of those alternatives were rejected through the CALFED process. The CALFED Programmatic ROD (page 6) specifically states that "documents tiering from the CALFED [Final PEIS/R] will not revisit the alternatives that were rejected during CALFED's alternative development process." Additionally, as explained in ALTR-1, "Range of Alternatives - General," Reclamation undertook a derivative, similar process for identifying reasonable alternatives in developing the action alternatives (i.e., comprehensive plans) for the SLWRI. Reclamation evaluated many alternatives, or management measures, beyond simply modifying or raising Shasta Dam. To reflect the much broader range of alternatives considered through the CALFED development process and in the SLWRI plan formulation process, the SLWRI Purpose statement has been revised as described above. Reclamation's purpose and need statement is reasonable and did not foreclose a reasonable range of alternatives.

Objectives On the basis of needs described below, the study authorities, and other pertinent direction, including the August 2000 CALFED Programmatic ROD, primary and secondary planning objectives were developed. The two primary project objectives (also referred to as planning objectives) and five secondary project objectives were developed for the SLWRI are:

- **Primary Project Objectives**

  - Increase the survival of anadromous fish populations in the Sacramento River, primarily upstream from the Red Bluff Pumping Plant (RBPP)

  - Increase water supply and water supply reliability for agricultural, M&I, and environmental purposes, to help meet current and future water demands, with a focus on enlarging Shasta Dam and Reservoir

- **Secondary Project Objectives**

  - Conserve, restore, and enhance ecosystem resources in the Shasta Lake area and along the upper Sacramento River

  - Reduce flood damage along the Sacramento River

  - Develop additional hydropower generation capabilities at Shasta Dam

  - Maintain and increase recreation opportunities at Shasta Lake

  - Maintain or improve water quality conditions in the Sacramento River downstream from Shasta Dam and in the Delta

Primary project objectives are those which specific alternatives are formulated to address. The two primary project objectives are considered to have coequal priority, with each pursued to the maximum practicable extent without adversely affecting the other. Secondary project objectives are considered to the extent possible through pursuit of the primary project objectives.

Some commenters suggest that the Primary Objectives are too narrowly drawn because "the water supply goal includes a 'focus on enlarging Shasta Dam and Reservoir.'" The objective, however, merely recognizes that studying the feasibility of raising Shasta Dam and Reservoir was not only an approved project in the CALFED Programmatic ROD, but authorized by two Federal statutes. If Reclamation did not provide some focus on raising Shasta Dam and Reservoir in the SLWRI plan formulation process, including the Final EIS, one could question Reclamation's authority to conduct the study in the first place. The objective does not state that Reclamation would not consider non-Shasta Dam enlargement alternatives, and nothing in the objective precludes Reclamation from doing so. The objective's focus on Shasta Dam and

Reservoir did not preclude Reclamation from considering other alternatives in the SLWRI plan formulation and alternative development process. As noted above, Reclamation considered numerous alternatives through the CALFED and SLWRI alternatives development processes. The Project's primary objectives are reasonable and did not preclude Reclamation from considering a reasonable range of alternatives.

Project Need As summarized in the Executive Summary and further described in Chapter 1 "Introduction," of the DEIS, the need for the SLWRI is for:

- **Anadromous Fish Survival** – The Sacramento River system supports four separate runs of Chinook salmon: fall-, late fall-, winter-, and spring-run. The adult populations of the four runs of salmon and other important fish species that spawn in the upper Sacramento River have considerably declined over the last 40 years. Several fish species in the upper Sacramento River have been listed under the Federal Endangered Species Act: Sacramento River winter-run Chinook salmon (endangered), Central Valley spring-run Chinook salmon (threatened), Central Valley steelhead (threatened), and the Southern Distinct Population Segment of North American green sturgeon (threatened). Two of these species are also listed under the California Endangered Species Act: Sacramento River winter-run Chinook salmon (endangered) and Central Valley spring-run Chinook salmon (threatened).

  Unsuitable water temperatures in the upper Sacramento River, especially in dry and critical years is a critical factor affecting the abundance of Chinook salmon and steelhead in the river. Water temperatures that are too high or, less commonly, too low, can be detrimental to the various life stages of Chinook salmon. Elevated water temperatures can negatively impact holding and spawning adults, egg viability and incubation, preemergent fry, and rearing juveniles and smolts, significantly diminishing the next generation of returning spawners. Stress caused by high water temperatures also may reduce the resistance of fish to parasites, disease, and pollutants. Releases of cold water from Shasta Reservoir can improve seasonal water temperatures in the Sacramento River downstream from Shasta Dam for anadromous fish during critical periods.

  Various Federal, State, and local projects are addressing factors contributing to declines in anadromous fish populations. Recovery actions range from changing the timing and magnitude of reservoir releases to structural changes at Shasta Dam. Despite these steps, additional actions are needed to

address anadromous fish survival in the upper Sacramento River.

- **Water Supply Reliability** – Demands for water in California exceed available supplies. Reclamation's 2008 Water Supply and Yield Study describes dramatic increases in statewide population, land use changes, regulatory requirements, and limitations on storage and conveyance facilities that have resulted in unmet water demands and subsequent increases in competition for water supplies among urban, agricultural, and environmental uses. The California Department of Water Resources (DWR) California Water Plan Update 2013 concludes that California is facing one of the most significant water crises in its history; drought impacts are growing, and climate change is affecting statewide hydrology. Challenges are greatest during drought years, when water supplies are less available.

  As the population of California grows, and the demand for adequate water supplies becomes more acute, the ability to maintain a healthy and viable industrial and agricultural economy while protecting aquatic species will be increasingly difficult. Compounding these issues, potential effects of climate change, such as changed precipitation patterns, less snowfall, and earlier snowmelt, may considerably increase the demands on available water supplies in the future. As owner and operator of the CVP, one of the largest water storage and conveyance systems in the world, Reclamation has identified the need to increase the reliability of CVP water deliveries to its water contractors, particularly during dry and critical water years. Similar needs and challenges are faced by the SWP and other water projects throughout the State. As one of many efforts to improve the reliability of California's water supply, the SLWRI was established to evaluate the potential to improve water supply reliability, primarily by modifying Shasta Dam and enlarging Shasta Lake.

- **Ecosystem Resources** – The quantity, quality, diversity, and connectivity of riparian, wetland, floodplain, and shaded riverine habitat in the Sacramento River ecosystem have been severely limited through confinement of the river system by levees, reclamation of adjacent lands for farming, bank protection, construction of dams and reservoirs, channel stabilization, and land development. This has contributed to a decline in habitat and native species populations. Ecosystem restoration along the Sacramento River has been the focus of several ongoing programs, including the Senate Bill 1086

Program, CVPIA, CALFED, Central Valley Habitat Joint Venture (CVHJV), and numerous local programs within the Central Valley. Despite these efforts, a significant need remains to conserve and restore ecosystem resources along the Sacramento River.

- **Flood Management** – Communities and agricultural lands in the Central Valley are subject to flooding along the Sacramento River that poses risks to human life, health, safety, and property. Physical impacts from flooding include damage to buildings, contents, automobiles, agricultural crops, and equipment. Threats from flooding are caused by many factors, including overtopping or sudden failures of levees, which can result in deep and rapid flooding with little warning. In addition, urban development in flood-prone areas has exposed the public to the risk of flooding.

- **Hydropower** – Although California is the most energy-efficient state per capita in the Nation, demands for electricity are growing at a rapid pace. Over the next 10 years, California's peak demand for electricity is expected to increase 30 percent, from about 50,000 megawatts (MW) to about 65,000 MW. In addition, Executive Orders S-14-08 and S-21-09, issued in 2008 and 2009, respectively, established a goal of using renewable energy sources, including hydropower, for 33 percent of the State's energy consumption by 2020. To meet renewable energy goals, significant increases in non-dispatchable intermittent renewable resources, such as wind and solar generation, will need to be added to California's power system. This means that other significant flexible generation resources, such as hydropower, will be needed to support and integrate renewable generation.

- **Recreation** – As California's population continues to grow, demands will increase substantially for water-oriented recreation at and near the lakes, reservoirs, streams, and rivers of the Central Valley. Further increases in demand, accompanied by relatively static recreation resources, will cause issues at existing recreation areas. These challenges will be especially pronounced at Shasta Lake, which is one of the most visited recreation destinations in the state and in the region. Even under current levels of demand, USFS, which manages recreation at Shasta Lake, has expressed concern about seasonal capacity problems at existing marinas and USFS facilities. A substantial and increasing need exists to improve recreation-related facilities and conditions at Shasta Lake.

- **Water Quality** – The Sacramento River and the Delta support fish and wildlife while providing water supplies for urban, agricultural, and environmental uses across the state. Saltwater intrusion, municipal discharges, agricultural drainage, and water project flows and diversions have led to water quality issues within the Delta, particularly related to salinity. In the Sacramento River, urban and agricultural runoff, and runoff and seepage from abandoned mining operations, have resulted in elevated levels of pesticides, phosphorous, mercury, and other metals. Additional operational flexibility could provide opportunities to improve Sacramento River and Delta water quality conditions.

33.3.4 Master Comment Response for Range of Alternatives – General

ALTR-1 – Range of Alternatives – General

Comments were received during the public comment period related to the SLWRI range of alternatives analyzed in the DEIS. These comments included suggested changes to SLWRI action alternatives, and the resulting range of alternatives evaluated in the EIS. In addition to the discussion below, please see Master Comment Response P&N-1, "Purpose and Need and Objectives," related to the development of the SLWRI purpose and need and objectives. Also, please see Master Comment Responses ALTD-1, "Alternative Development – Water Supply Reliability" and ALTD-2, "Alternative Development – Anadromous Fish Survival," related to measures considered during the plan formulation process to address water supply reliability and anadromous fish survival; and Master Comment Response ALTS-1, "Alternative Selection," for alternative selection (e.g., identification of the preferred alternative and Clean Water Act Section 404 compliance).

This Master Comment Response first describes the NEPA requirements for alternatives development; the CALFED alternative development process, the SLWRI alternative development process, and a conclusion paragraph summarizing how the range of alternatives meet NEPA requirements.

NEPA Requirements for Alternatives Development NEPA requires that an EIS "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. Code (USC) Sec. 4332(2)(E)). NEPA includes provisions that the draft environmental review analyze all reasonable alternatives, including the No-Action Alternative, that meet most of the purpose and need/objectives, and are potentially feasible (40 CFR § 1502.14; 43 CFR § 46.420(b)). Under NEPA, "reasonable" is generally understood to mean those technically and economically feasible project alternatives

that would satisfy the primary objectives of the project defined in the Purpose and Need statement (43 CFR 46.420). The CEQ's "Forty Questions" adds that "Reasonable alternatives include those that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant.

The "rule of reason" applies to the choice of alternatives as well as the extent to which the EIS must discuss each alternative. *Citizens Against Burlington, Inc. v. Busey,* 938 F.2d 190, 195 (D.C. Cir 1991) (quoting *State of Alaska v. Andrus*, 580 F.2d 465, 475 (D.C. Cir 1978). The Federal Court of Appeal in *Friends of Southeast's Future v. Morrison*, 153 F. 3rd 1059 (9th Cir. 1998) stated that "[w]hen the purpose [of the project] is to accomplish one thing, it makes no sense to consider alternative ways by which another thing might be achieved." Additionally, an agency may eliminate an alternative from detailed discussion in an EIS, but must briefly explain the reason for doing so. 40 CFR 1502.14(a).

Recently, two Federal courts in California upheld the alternatives development process and range of alternatives considered by BLM in approving the construction, operation, and maintenance of two commercial-scale renewable energy projects. In *Protect Our Communities*, 2013 U.S. Dist. LEXIS 159281, the BLM authorized a commercial-scale wind energy project on public land. In developing its alternatives, the BLM considered eighteen potential alternatives, but only six alternatives were developed and evaluated in-detail in the EIS. *Id*. at 14. The five action alternatives all provided for the construction, operation, and maintenance of a wind energy project. *Id*. The BLM provided a short explanation as to why all of the non-wind alternatives were not carried forward and fully analyzed in the EIS. *Id*. at 15. Similarly, in *La Cuna De Aztlan Sacred Sites Protection Circle Advisory Committee v. Interior*, 2013 U.S. Dist. LEXIS 123331 (E.D. Cal. 2013), the BLM authorized a commercial-scale solar energy project. In developing the range of alternatives, the BLM considered 22 alternatives, but only fully evaluated three action alternatives in the final EIS, all of which proposed to construct, operate, and maintain a solar energy project. *Id*. at 8, 9, 17. In both cases, the court upheld the BLM's alternatives development process and the resulting range of alternatives carried forward for detailed analysis.

CALFED Alternatives Development Process CALFED evaluated numerous alternatives, and the resulting Preferred Program Alternative in the Final PEIS/R identified surface storage projects to be pursued with project-specific studies, in particular expanding CVP storage in Shasta Lake by approximately 300 thousand acre-feet. The SLWRI Final EIS was revised to clarify that, consistent with guidance in the

CALFED Programmatic ROD, this EIS tiers to the CALFED PEIS/R and relies on evaluations and alternatives development and screening included in the CALFED PEIS/R. The below discussion describes the CALFED alternatives development process and its relationship to the SLWRI alternatives development process.

CALFED is a consortium of federal and State agencies working to restore ecological health and improve water management for beneficial uses of the San Francisco Bay/Sacramento–San Joaquin River Delta estuary. The CALFED effort is a collaboration between these agencies and Bay-Delta "stakeholders"—urban and agricultural water users, fishing interests, environmental organizations, businesses, and others—who contribute to CALFED design, problem solving, and decision making (CALFED 2002).

The CALFED planning effort was divided into three phases. Phase I defined the problems and a range of solutions and Phase II included the selection of the Preferred Program Alternative. Phase III is implementation of the Preferred Program Alternative, which includes the project-specific environmental evaluation of projects, including SLWRI. Below describes the alternative development process associated with Phase I and Phase II of the CALFED planning process.

During Phase I of the CALFED planning effort, the CALFED participants identified actions to resolve Bay-Delta problems and developed these actions into a set of alternatives for programmatic environmental review. Early in Phase I, 50 categories of actions to resolve Bay-Delta problems and achieve program objectives were identified. Given the large number of categories and range of perspectives on solutions, thousands of potential alternatives could have been identified. Therefore, the program devised a methodology that defined the critical conflicts and defined approaches to those conflicts. Ultimately, 100 preliminary solution alternatives were identified. Continued consolidation and balancing of the alternatives brought the number to 20. These 20 alternatives were presented to stakeholders, BDAC members, and to the public at a workshop. Consolidation and refinement of the alternatives, based on the workshop, produced 10 alternatives which were then compared against the programs' solution principles and it was found that three basic alternative approaches could be formed around different configuration of Delta conveyance. Each approach included the same set of four programs that are common to all alternatives and involves water use efficiency, water quality, levee system integrity, and ecosystem quality. Storage for each alternative could be evaluated to support these programs and the Delta conveyance and seek a balance between attainment of program objectives and cost effectiveness and were considered variable program elements (CALFED 2000).

Three basic alternative approaches from Phase I were carried into Phase II of the CALFED planning effort. Seventeen variations of the three basic alternative approaches were then developed to further explore potential refinements for the two variable program elements, storage and conveyance. The narrowing process (which included focusing on technical deficiencies and conveyance options) refined the seventeen variations of the three basic alternative approaches to twelve variations. Impacts of the three basic alternative approaches were evaluated in the CALFED 1998 Draft PEIS/R. Some of the twelve variations were eliminated or consolidated for technical reasons, and four action alternatives, (including the Preferred Program Alternative), were evaluated in the CALFED Final PEIS/R. Each of the four action alternatives considered in the CALFED Final PEIS/R include the Ecosystem Restoration, Water Quality, Levee System Integrity, Water Use Efficiency, Water Transfer, Watershed Storage, and Conveyance elements. Each of the action alternatives included an assessment with additional storage up to 6 million acre feet (MAF) and without storage.

The Phase II Report, included as an appendix in the Final PEIS/R, presented potential near-term and long-term implementation strategies for implementation of the Preferred Program Alternative. The report discusses how CALFED and its cooperating agencies had conducted a preliminary screening of potential surface storage locations and project configurations, and then selected a smaller number for more detailed evaluation. Shasta Lake Enlargement, among other storage projects, was retained for additional CALFED consideration as it appeared to be promising in helping to meet CALFED goals and objectives. In addition, it was determined that Shasta Lake Enlargement would provide significant benefits and generally result in lower environmental impacts than the remaining sites. The Phase II Report states that CALFED will aggressively pursue Shasta Lake enlargement through full State and Federal commitment to the process and evaluations necessary for implementation.

Phase II concluded in August 2000 with the filing of the Programmatic ROD, including certification, for the CALFED Final PEIS/R (CALFED 2002). The CALFED Programmatic ROD states that expanding the CVP storage in Shasta Lake by approximately 300 thousand acre-feet would be pursed with a project-specific study.

The California Supreme Court upheld the validity of the CALFED Final PEIS/R and CALFED Programmatic ROD, including the alternatives development process and range of alternatives. *In Re Bay-Delta Programmatic Environmental Impact Report Coordinated Proceedings*, 184 P.3d 709 (Cal. 2008). As described below, the SLWRI development process is a derivative of and similar to the CALFED development process, and the SLWRI EIS tiers to the CALFED Final PEIS/R.

The SLWRI Final EIS was revised to clarify that Reclamation not only considered the CALFED Final PEIS/R in analyzing the environmental impacts of the SLWRI, but that this EIS tiers to the CALFED Final PEIS/R. In developing the CALFED Final PEIS/R, the CALFED agencies, including Reclamation, evaluated a broad range of water management options (with and without storage) to be implemented to achieve the CALFED goals. The SLWRI Final EIS was also revised to clarify that, consistent with guidance in the CALFED Programmatic ROD, the SLWRI EIS relies on evaluations and alternatives development and screening included in the CALFED PEIS/R. These revisions were primarily made in EIS Chapters 1, "Introduction," and Chapter 2, "Alternatives," and in Chapter 2, "Management Measures," of the Plan Formulation Appendix.

SLWRI Alternatives Development Process The DEIS Plan Formulation Appendix provides detailed background on the SLWRI alternatives formulation/development process and the development of the project's range of alternatives. This information is summarized in the DEIS in Chapter 2, "Alternatives" and described below.

The SLWRI alternative formulation/development process and development of the project's range of alternatives started with the development of the purpose and need, planning objectives (also referred to as project objectives), constraints and criteria. See MCR P&N-1 regarding the development of the purpose and need and objectives.

After development of the purpose and need, planning objectives, constraints, and criteria, the next major step in plan formulation was to define management measures. A management measure is any structural or nonstructural project action or feature that could address the planning objectives and satisfies the other applicable planning considerations.

More than 60 potential management measures, described in detail in Chapter 2 of the Plan Formulation Appendix, "Management Measures," were identified, evaluated, and screened as part of the SLWRI plan formulation process to address the primary and secondary planning objectives and satisfy the other applicable screening criteria (see Chapter 2 of the Plan Formulation Appendix "Planning Constraints, Considerations and Criteria"). The Plan Formulation Appendix includes a wide range of management measures representing diverse viewpoints and needs based on both planning processes internal to Reclamation and public scoping, including interaction with key regulatory and land management agencies. Reclamation looked at many management measures, beyond simply modifying or raising Shasta Dam, as further described below. The management measures included constructing instream fish habitat on tributaries to the Sacramento River; increased instream flows on Clear, Cow, and Bear creeks; constructing a migrating

corridor from the Sacramento River to the Pit River; constructing new reservoirs in other locations, such as on the Sacramento River upstream from Shasta Reservoir, on tributaries downstream from Shasta Dam (e.g., Cottonwood Creek and Auburn Dam Projects); offstream storage near the Sacramento River downstream from Shasta Dam (e.g., Sites Reservoir); and many others. One important factor was the potential for a management measure to directly address a planning objective without adversely impacting other objectives. Management measures deleted from further consideration are described in detail in the Plan Formulation Appendix, along with the reasons for deleting measures from further consideration and development.

Many of the management measures evaluated during this process, including measures not related to the raising of Shasta Dam, were considered under CALFED. Since the SLWRI EIS tiers to the CALFED PEIS/R, it relies on the analysis and screening evaluations performed for the CALFED PEIS/R. While revisiting alternatives that were considered alongside CALFED's Preferred Program Alternative is not required, many of the management measures, including measures not related to the raising of Shasta Dam, were also evaluated in the *Initial Alternatives Information Repor*t (Reclamation 2004), the *Ecosystem Restoration Opportunities Report* (Reclamation 2003b), the *Plan Formulation Report* (Reclamation 2007). Text has been revised in Chapter 2, "Management Measures," of the Plan Formulation Appendix to clarify which measures were also evaluated under CALFED and to clarify the relationship of the CALFED evaluation and screening process to the evaluation and screening of SLWRI management measures.

Text has also been revised in Chapter 2 of the Plan Formulation Appendix to clarify the relationship of SLWRI management measures to actions under the CALFED Ecosystem Restoration Program (ERP). The ERP was included as part of the CALFED Preferred Program Alternative. The goal of the CALFED ERP is to improve and increase aquatic and terrestrial habitats and improve ecological functions in the Bay-Delta system to support sustainable populations of diverse and valuable plant and animal species. The CALFED ERP includes multiple actions to meet this goal. These actions encompass many of the management measures considered under the SLWRI to address increasing anadromous fish survival and conserving, restoring, and enhancing ecosystem resources.

Following management measures development and screening, the next phases of the plan formulation process involved combining retained management measures to formulate concept plans (plans which are conceptual in scope). The management measures and concept plans carried forward were then further refined and developed with more

specificity to formulate comprehensive plans (i.e., alternatives) to address the planning objectives.

In addition to the No-Action Alternative, the DEIS assesses a range of feasible alternatives (or comprehensive plans) that meets the project purpose and thoroughly describes the reasons why other potential actions were dismissed from further consideration. These alternatives provide decision makers with a refined, but feasible, action with which the study objectives may be accomplished. The adverse or beneficial environmental impacts of each alternative are evaluated within each resource area chapter. The alternatives analyzed in the DEIS are those that best meet the NEPA primary and secondary objectives, minimize negative effects, and are potentially feasible.

This development of SLWRI management measurement and alternative process was documented through a series of planning documents made available to the public, including:

- *Enlarged Shasta Lake Investigation Preliminary Findings Report* (1983)
- *Shasta Dam and Reservoir Enlargement, Appraisal Assessment of the Potential for Enlarging Shasta Dam and Reservoir* (1999a)
- *SLWRI Strategic Agency and Public Involvement Plan* (2003b)
- *SLWRI Mission Statement Milestone Report* (2003a)
- *Ecosystem Restoration Opportunities Report* (Reclamation 2003b)
- *SLWRI Initial Alternatives Information Report (2004), SLWRI Environmental Scoping Report (2006), and SLWRI Plan Formulation Report* (2007)

Conclusion As explained above, Reclamation considered an extensive range of management measures/alternatives that reflect a broad range of views about how to achieve the purpose and need and objectives of the SLWRI. The CALFED plan formulation and DEIS alternative development process included extensive public involvement with participants from a wide range of viewpoints. In this open process, Reclamation defined the primary and secondary objectives essential to SLWRI; developed over 60 potential management measures; refined the list of potential management measures; identified the best management measures and combined these measures into numerous alternatives; selected a wide range of potentially feasible alternatives; and rejected

management measures/alternatives that did not satisfy the project purpose, such as meeting only one of the primary objectives at the detriment of the other. This process fostered meaningful public participation in the development of alternatives and allowed for informed decision making in the refinement of the alternatives. The alternatives considered in the EIS represent a reasonable range of alternatives that will permit a reasoned choice by Reclamation.

Reclamation undertook a robust alternatives development process in developing the SLWRI and this EIS. Reclamation has thoroughly explained its process for developing the range of alternatives carried forward in the EIS and explained why alternatives and management measures were rejected from detailed discussion in the EIS, consistent with the alternatives development processes upheld in *Protect Our Communities* and *La Cuna* (discussed above). Reclamation is required to examine a reasonable range of alternatives, and provided a detailed analysis of the action alternatives and No Project/No Action Alternative, but is not obligated to undertake a detailed examination of every conceivable measure that could benefit water supply reliability or fisheries enhancements.

33.3.5 Master Comment Responses for Alternatives Development

ALTD-1 – Alternative Development – Water Supply Reliability
Comments received during the public comment period suggested that Reclamation consider additional measures or options for increasing water supply reliability. The following discussion addresses measures proposed by commenters to increase water supply reliability that were previously evaluated during the SLWRI plan formulation process. In addition, please see Master Comment Response ALTD-2, "Alternative Development – Anadromous Fish Survival," related to measures considered to address anadromous fish survival and Master Comment Response P&N-1, "Purpose and Need and Objectives," related to regarding the development of the SLWRI purpose and need and objectives. Also, please see Master Comment Response ALTR-1, "Range of Alternatives," which describes NEPA requirements for alternatives development, the relationship of SLWRI to CALFED, and development of the SLWRI alternatives; and Master Comment Response ALTS-1, "Alternative Selection," for the alternative selection (e.g., identification of the preferred alternative and Clean Water Act Section 404 (b) (1) Least Environmentally Damaging Practicable Alternative compliance).

The Plan Formulation Appendix provides detailed background on the SLWRI purpose and need, project objectives, alternatives formulation/development process, and the development of the project's range of alternatives. This is summarized above in Master Comment

Responses P&N-1, "Purpose and Need and Objectives," and ALTR-1, "Range of Alternatives." As described, the plan formulation process for the SLWRI was deliberative and iterative and was separated into multiple phases. The first phases of this process focused on defining the problems, needs, and opportunities, and inventorying and forecasting conditions in the study area to define a specific set of planning objectives. The next phases of the plan formulation process were to define water management measures and ways of combining the most appropriate of these measures in to concept plans. Finally, the later phases of the plan formulation process were to formulate, evaluate and compare these concept plans to develop complete alternatives, called comprehensive plans in the EIS.

Management Measures Considered to Address Increasing Water Supply Reliability Chapter 2, "Management Measures," of the Plan Formulation Appendix, describes the identification, evaluation, and screening of management measures to address primary and secondary project objectives. A management measure is any structural or nonstructural project action or feature that could address the planning objectives and satisfies the other applicable planning considerations. As described in the Plan Formulation Appendix, more than 60 potential management measures were developed through study team meetings, field inspection, public outreach, and environmental scoping for the EIS.

Many of the management measures, including measures not related to the raising of Shasta Dam, were considered under CALFED. The SLWRI EIS tiers to the CALFED PEIS/R, it relies on the analysis and screening evaluations performed for the CALFED PEIS/R. While revisiting alternatives that were considered alongside CALFED's Preferred Program Alternative is not required, many of the management measures, including measures not related to the raising of Shasta Dam, were also evaluated in the *Initial Alternatives Information Repor*t (Reclamation 2004), the *Plan Formulation Report* (Reclamation 2007), and in the Plan Formulation Appendix, in Chapter 2, "Management Measures."

Management measures were evaluated and screened and either retained for potential inclusion in concept plans or deleted from further development. A primary consideration during this process is the potential ability of each management measure to address project objectives. During this process, 22 management measures were identified to address the primary objective of increasing water supply reliability for M&I, agricultural, and environmental purposes to help meet current and future water demands. Of the 22 measures considered to help increase water supply reliability, four were retained for possible inclusion in concept plans during the initial plans phase.

The following summary discusses 13 management measures considered to increase water supply reliability for which public comments were received on the DEIS. There were no comments on the other 9 management measures. The relevant measures are separated into categories including: increased surface water storage, improved conjunctive water management, demand reduction, and improved surface water treatment.

Increased Surface Water Storage The following management measures to increase surface water storage were evaluated for the SLWRI. These management measures, and rationale for retaining or deleting each measure, are described in more detail in the Plan Formulation Appendix, in Chapter 2, "Management Measures," under Subsection "Increase Water Supply Reliability," in Section "Measures to Address Primary Planning Objectives."

Construct New Conservation Storage Reservoir(s) Upstream from Shasta Reservoir This measure was considered under CALFED and consisted of constructing dams and reservoirs at one or more locations upstream from Shasta Lake, primarily for increased water conservation storage and operational flexibility. The construction of new conservation storage reservoir(s) upstream from Shasta Reservoir was deleted as it has limited potential to effectively contribute to increased system water supply reliability or other planning objectives. Upstream storage sites capable of CVP system-wide benefits (1) would only be capable of marginally improving water supply reliability to the CVP, (2) would not be consistent with screening criteria established in the CALFED Integrated Storage Investigations (e.g., would not provide a minimum storage capacity of at least 200,000 acre-feet), (3) would likely not be supported in the local area because the water would need to be developed for CVP system reliability (not retained for local use), and (4) would result in a relatively high unit water cost to implement.

Construct New Conservation Storage on Tributaries to the Sacramento River Downstream from Shasta Dam This measure consisted of constructing offstream reservoir storage along tributaries to the Sacramento River downstream from Shasta Dam. This measure was investigated under CALFED and in other past studies. Several projects were identified as having potential to contribute considerably to increasing water supply reliability, including the Cottonwood Creek Project, the Auburn Dam Project, and the Marysville Lake Project. However, these projects have been rejected by State and local interests. This measure was deleted from further consideration in the SLWRI as potential onstream surface storage projects downstream from Shasta Dam would not efficiently contribute to the primary planning objective of increasing water supply reliability (e.g., would result in a relatively high unit water cost to implement compared to enlarging Shasta

Reservoir and other storage projects identified in the CALFED Preferred Program Alternative) or because they would have significant overriding environmental issues and opposition.

Construct New Conservation Offstream Surface Storage near the Sacramento River Downstream from Shasta Dam This measure was considered under CALFED and consisted of constructing offstream reservoir storage near the Sacramento River downstream from Shasta Dam. All but one of the offstream reservoir storage projects were eliminated from further consideration in the CALFED Programmatic ROD. The one project retained for further consideration in the CALFED Programmatic ROD is Sites Reservoir. DWR and Reclamation are studying Sites Reservoir under the North-of-the-Delta Offstream Storage (NODOS) Project as an independent project from SLWRI. Therefore, this measure was deleted from further consideration.

Construct New Conservation Surface Water Storage South of the Sacramento-San Joaquin Delta This measure was considered under CALFED and consisted of constructing new conservation surface water storage south of the Sacramento-San Joaquin Delta. Except those included in the CALFED Preferred Program Alternative, all of the potential onstream or offstream storage projects south of the Delta were deleted from further consideration primarily because they would not (1) contribute to the primary objective of increasing anadromous fish survival in the upper Sacramento River or (2) be as efficient or effective at increasing water supply reliability as additional storage in an enlarged Shasta Reservoir. In addition, feasibility-scope investigations for both Los Vaqueros Reservoir and upper San Joaquin River storage were authorized in Section 215 of Public Law 108-7. Both studies are addressing specific planning objectives that are unique to their geographic areas, but differ from those of the SLWRI.

Increase Total or Seasonal Conservation Storage at Other CVP Facilities This measure was considered under CALFED and primarily consisted of providing additional conservation storage space in other major CVP (and/or SWP) reservoirs in the Sacramento River watershed through enlarging existing dams and reservoirs. This measure was deleted from further consideration in the SLWRI primarily because potential enlargement of other existing CVP (and/or SWP) facilities in the Sacramento River watershed would not efficiently contribute to the primary planning objective of increasing water supply reliability (e.g., would result in a relatively high unit water cost to implement compared to enlarging Shasta Reservoir) or because they would have significant overriding environmental issues. It is believed that, of the existing reservoirs in the CVP/SWP systems, increasing water supply reliability through modifying Shasta Dam and Lake would be the most cost-effective. Further, all known efforts to increase storage space in other

Northern California CVP (or SWP) reservoirs were rejected by CALFED and local interest groups.

Dredge Bottom of Shasta Reservoir This measure consisted of increasing the total storage space in Shasta Reservoir by excavating either deposited or native materials below full pool elevation. Dredging Shasta Reservoir was not retained as a management measure because it has limited potential to effectively contribute to increases in system water supply reliability or any other planning objective. Dredging the bottom of Shasta Reservoir would have an extremely high cost for new storage space with very small potential benefit and severe environmental impacts for disposal of materials.

Improved Conjunctive Water Management The following management measures to improve conjunctive water management were evaluated. These management measures, and rationale for retaining or deleting each measure, are described in more detail in the Plan Formulation Appendix, in Chapter 2, "Management Measures," Subsection "Increase Water Supply Reliability," within Section "Measures to Address Primary Planning Objectives."

Develop Conservation Offstream Surface Storage near the Sacramento River Downstream from Shasta Dam This measure was considered under CALFED and consisted of developing surface water transfer storage capabilities near the Sacramento River downstream from Shasta Dam to use in conjunction with storage in Shasta Reservoir. This storage would be an extension of storage space in Shasta Reservoir. One possibility identified would be to consider some of the space in the Sites Reservoir project, or the North-of-the-Delta Offstream Storage (NODOS) Project, which was previously described as new conservation surface storage for Shasta Reservoir. This possibility is being considered in studies by DWR and Reclamation. However, DWR and Reclamation are studying Sites Reservoir under the NODOS Project as an independent project from SLWRI. Therefore, this measure was deleted from further consideration.

Develop Conservation Groundwater Storage near the Sacramento River Downstream from Shasta Dam This measure consisted of developing groundwater storage near the Sacramento River. The development of conservation groundwater storage near the Sacramento River downstream from Shasta Dam in-lieu option of this measure was initially retained for further development primarily because it would have potential to increase water supply reliability. However, it was eliminated during the comprehensive plan phase because subsequent operations modeling indicated tradeoffs between conjunctive use water supply benefits and critical gains in fisheries accomplishments. The

resulting reduction in benefits to fisheries in dry and critical years was deemed unacceptable in terms of meeting primary project objectives.

Develop Additional Conservation Groundwater Storage South of the Sacramento-San Joaquin Delta This measure was considered under CALFED and consisted of either developing new groundwater recharge projects south of the Delta or contributing to existing recharge projects. This measure was deleted from further consideration in the SLWRI primarily because it would not be as effective or efficient as increased storage space in Shasta Reservoir and would not contribute to the primary planning objective of increasing anadromous fish survival in the upper Sacramento River.

Reduced Demand The following management measures to reduce demand were evaluated. These management measures, and rationale for retaining or deleting each measure, are described in more detail in the Plan Formulation Appendix, in Chapter 2, "Management Measures," Subsection "Increase Water Supply Reliability," within Section "Measures to Address Primary Planning Objectives."

Implement Water use Efficiency Methods This measure was considered under CALFED. This measure consisted of implementing water use efficiency methods to help reduce current and future water shortages by allowing a more effective use of existing supplies. The measure to implement water use efficiency methods was retained because urban and agricultural water use efficiency methods could help reduce current and future water shortages by allowing a more effective use of existing supplies. This measure was subsequently further refined and included as one of the eight common management measures, as the "Reduce Demand" measure, included in all action alternatives. The eight common management measures are described in EIS Chapter 2, "Alternatives," in Section 2.3.1, "Management Measures Common to All Action Alternatives."

As described in Chapter 2, "Alternatives," of the DEIS, all action alternatives include a water conservation program to augment current water use efficiency practices. The proposed program would consist of a 10-year initial program to which Reclamation would allocate approximately $1.6 million to $3.8 million to fund water conservation efforts. Funding would be proportional to additional water supplies delivered and would focus on assisting project beneficiaries (agencies receiving increased water supplies because of the project), with developing new or expanded agricultural and M&I water conservation and water recycling programs. Program actions would be a combination of technical assistance, grants, and loans to support a variety of water conservation projects, such as recycled wastewater projects, irrigation system retrofits, and urban utilities retrofit and replacement programs.

The program could be established as an extension of existing Reclamation programs, or as a new program through teaming with cost-sharing partners. Combinations and types of water use efficiency actions funded would be tailored to meet the needs of identified cost-sharing partners, including consideration of cost-effectiveness at a regional scale for agencies receiving funding.

Retire Agricultural Lands This measure consisted of retiring agricultural lands**.** The ability of this measure to meet future water demands in the Central Valley during drought periods is limited because marginal lands are already often allowed to fallow during drought periods. Further, there would be a high degree of uncertainty regarding the institutional ability to acquire sufficient additional land rights necessary to preclude future irrigated agriculture on lands identified for inclusion in a project/program. This measure was deleted from further consideration in the SLWRI as it likely has limited ability to actually help meet future water demands in the Central Valley and would not address the primary objective of increasing anadromous fish survival. Furthermore, at a large scale, this measure could have considerable negative impacts on agricultural production and related industries.

Improved Surface Water Treatment The following management measures to improve surface water treatment were evaluated. These management measures, and rationale for retaining or deleting each measure, are described in more detail in the Plan Formulation Appendix, in Chapter 2, "Management Measures," Subsection "Increase Water Supply Reliability," within Section "Measures to Address Primary Planning Objectives."

Implement Treatment/Supply of Agricultural Drainage Water This measure consisted of collecting agricultural drainage from farms along the Sacramento and San Joaquin Rivers and treating the drainage water for reuse. This measure was deleted from further consideration as it would be costly to initially implement and operate, problems would exist relating to brine disposal, and it would likely be unacceptable to stakeholders and the public.

Construct Desalination Facility This measure was considered as part of the CALFED Water Use Efficiency Program (CALFED 2006). This measure consisted of constructing seawater or brackish surface or groundwater desalination plants to supplement existing water supplies and help offset future demands. The construction of a desalination facility was not retained because desalination has low potential to address SLWRI planning objectives of agricultural water supply reliability. Desalination would not be an efficient alternative to new storage at Shasta Reservoir because it would be highly inefficient in

providing drought period supplies and its unit costs would be far greater than new supplies from Shasta Reservoir or other sources.

ALTD-2 – Alternative Development – Anadromous Fish Survival
Comments received during the public comment period suggested that Reclamation consider additional measures or options for increasing anadromous fish survival. The following discussion addresses measures proposed by commenters to increase anadromous fish survival that were previously evaluated during the SLWRI plan formulation process. In addition, please see Master Comment Response ALTD-1, "Alternative Development – Water Supply Reliability," related to measures considered to address water supply reliability and Master Comment Response P&N-1, "Purpose and Need and Objectives," related to regarding the development of the SLWRI purpose and need and objectives. Also, please see Master Comment Response ALTR-1, "Range of Alternatives," which describes NEPA requirements for alternatives development, the relationship of SLWRI to CALFED, and development of the SLWRI alternatives; and Master Comment Response ALTS-1, "Alternative Selection," for the alternative selection (e.g., identification of the preferred alternative and Clean Water Act Section 404 compliance).

The Plan Formulation Appendix provides detailed background on the SLWRI purpose and need, project objectives, alternatives formulation/development process, and the development of the project's range of alternatives. This is summarized above in Master Comment Responses P&N-1, "Purpose and Need and Objectives," and ALTR-1, "Range of Alternatives." As described, the plan formulation process for the SLWRI was deliberative and iterative and was separated into multiple phases. The first phases of this process focused on defining the problems, needs, and opportunities, and inventorying and forecasting conditions in the study area to define a specific set of planning objectives. The next phases of the plan formulation process were to define water management measures and ways of combining the most appropriate of these measures in to concept plans. Finally, the later phases were to formulate, evaluate and compare these concept plans to develop complete alternatives, called comprehensive plans in the EIS.

Management Measures Considered to Address Increasing Anadromous Fish Survival Chapter 2, "Management Measures," of the Plan Formulation Appendix, describes the identification, evaluation, and screening of management measures to address primary and secondary project objectives. A management measure is any structural or nonstructural project action or feature that could address the planning objectives and satisfies the other applicable planning considerations. As described in the Plan Formulation Appendix, more than 60 potential

management measures were developed through study team meetings, field inspection, public outreach, and environmental scoping for the EIS.

Many of the management measures, including measures not related to the raising of Shasta Dam, were considered under CALFED. The SLWRI EIS tiers to the CALFED PEIS/R, it relies on the analysis and screening evaluations performed for the CALFED PEIS/R. While revisiting alternatives that were considered alongside CALFED's Preferred Program Alternative is not required, many of the management measures, including measures not related to the raising of Shasta Dam, were also evaluated in the *Initial Alternatives Information Repor*t (Reclamation 2004), the *Ecosystem Restoration Opportunities Report* (Reclamation 2003b), the *Plan Formulation Report* (Reclamation 2007), and in the Plan Formulation Appendix, in Chapter 2, "Management Measures."

Specifically, the ERP was included as part of the CALFED Preferred Program Alternative. The goal of the CALFED ERP is to improve and increase aquatic and terrestrial habitats and improve ecological functions in the Bay-Delta system to support sustainable populations of diverse and valuable plant and animal species. The CALFED ERP includes multiple actions to meet this goal, including (1) protecting, restoring, and managing diverse habitat types representative of the Bay-Delta and its watershed, (which includes the Sacramento River and its tributaries), (2) modifying or eliminating fish passage barriers, including the removal of some dams, construction of fish ladders, and construction of fish screens that use the best available technology, and (3) restoring aspects of the sediment regime by relocating in-stream and floodplain gravel mining, and by artificially introducing gravels to compensate for sediment trapped by dams. These actions encompass many of the management measures considered under the SLWRI to address increasing anadromous fish survival. The ERP has prioritized restoration actions and funded approximately $630 million of ecosystem restoration activities, including $22 million for river channel restoration, $46 million in riparian habitat restoration, $103.1 million for fish screens, and $42.9 million for fish passage (DFG et al., 2010).

Management measures were reviewed for their ability to address the primary and secondary planning objectives. Management measures were evaluated and screened and either retained for potential inclusion in concept plans or deleted from further development. During this process, 22 management measures were identified to address the primary objective of increasing anadromous fish survival. Of the 22 measures considered to help increase water supply reliability, six were retained for possible inclusion in concept plans during the initial plans phase.

The following summary discusses 18 management measures considered to address increasing anadromous fish survival for which public comments were received on the DEIS. There were no comments on the other four management measures. The relevant measures are separated into categories including: improve fish habitat, improve water flows and quality, and improve fish migration.

Improve Fish Habitat The following management measures to improve fish habitat were evaluated. These management measures, and rationale for retaining or deleting each measure, are described in more detail in the Plan Formulation Appendix, in Chapter 2, "Management Measures," Section "Increase Anadromous Fish Survival," within Section "Measures to Address Primary Planning Objectives."

Construct Instream Aquatic Habitat Downstream from Keswick Dam This measure consisted of constructing aquatic habitat in and adjacent to the Sacramento River downstream from Keswick Dam to encourage use of this reach by anadromous fish for reproduction. This measure was retained for further development as part of the SLWRI, because it had potential to successfully address the first primary planning objective and due to high interest from fisheries agencies. Furthermore, this measure is likely to combine favorably with other potential measures related to Shasta Dam and Reservoir and their operation. This measure was further developed during the comprehensive plans phase, and included as side channel habitat restoration within the plan component "restoring riparian, floodplain, and side channel habitat in the upper Sacramento River," which was incorporated into CP4, CP4A, and CP5. This component is discussed further in Chapter 2 of the EIS in Section 2.3, "Action Alternatives." Further, the ERP has evaluated, prioritized, and funded ecosystem restoration actions identified in the CALFED Preferred Program Alternative. This measure and similar activities were encompassed in the ERP action related to protecting, restoring, and managing diverse habitat types representative of the Bay-Delta and its watershed, (which includes the Sacramento River and its tributaries).

Replenish spawning gravel in the Sacramento River – This measure initially consisted of a single application of spawning-sized gravel at a discrete location in the Sacramento River between Keswick and RBPP. Under this measure, gravel would be transported and placed into the Sacramento River downstream from Keswick Dam. This measure was retained for further development as part of the SLWRI because it has potential to successfully address the primary planning objective of increasing anadromous fish survival. Furthermore, it is likely to combine favorably with other potential measures related to Shasta Dam and Reservoir and their operation. This measure was further developed during the comprehensive plans phase to include a 10-year implementation and was included as the plan component "augment

spawning gravel in the upper Sacramento River," which was incorporated into CP4, CP4A, and CP5. This component is discussed further in Chapter 2, "Alternatives," of the EIS in Section 2.3, "Action Alternatives." Further, the ERP has evaluated, prioritized, and funded ecosystem restoration actions identified in the CALFED Preferred Program Alternative. This measure and similar activities were encompassed in the ERP action related to restoring aspects of the sediment regime by relocating in-stream and floodplain gravel mining, and by artificially introducing gravels to compensate for sediment trapped by dams.

Construct Instream Fish Habitat on Tributaries to the Sacramento River This measure consisted of improving instream aquatic habitat along the lower reaches of tributaries to the Sacramento River. Under this measure, various structural techniques would be employed to trap spawning gravels in deficient areas, create pools and riffles, provide instream cover, and improve overall instream habitat conditions. This measure would have benefits for tributaries. However, it was deleted from further development as part of the SLWRI, primarily because it is independent of hydraulic/hydrologic conditions in the upper Sacramento River, would not improve ecological conditions or fish habitat along mainstem Sacramento River, and, therefore would not directly contribute to increasing anadromous fish survival within the primary Sacramento River study area. The ERP has evaluated, prioritized, and funded ecosystem restoration actions identified in the CALFED Preferred Program Alternative. Further, this measure and similar activities were encompassed in the ERP action related to protecting, restoring, and managing diverse habitat types representative of the Bay-Delta and its watershed, (which includes the Sacramento River and its tributaries).

Remove Instream Sediment Along Middle Creek This measure consisted of implementing a sediment removal and control program along Middle Creek, an intermittent tributary to the Sacramento River between Keswick Dam and Redding. This measure was deleted from further development primarily because it is independent of hydraulic/hydrologic conditions in the upper Sacramento River, would not improve ecological conditions or fish habitat along mainstem Sacramento River, and, therefore would not directly contribute to increasing anadromous fish survival within the primary Sacramento River study area.

Rehabilitate Inactive Instream Gravel Mines Along Stillwater and Cottonwood Creeks This measure consisted of rehabilitating ecological conditions in former instream gravel mining sites along Stillwater Creek**.** This measure was deleted from further development primarily because it is independent of hydraulic/hydrologic conditions in the upper

Sacramento River, would not improve ecological conditions or fish habitat along mainstem Sacramento River, and, therefore would not directly contribute to increasing anadromous fish survival within the primary Sacramento River study area. Further, the ERP has evaluated, prioritized, and funded ecosystem restoration actions identified in the CALFED Preferred Program Alternative. This measure and similar activities were encompassed in the ERP action related to restoring aspects of the sediment regime by relocating in-stream and floodplain gravel mining, and by artificially introducing gravels to compensate for sediment trapped by dams.

Improve Water Flows and Quality The following management measures to improve water flows and quality were evaluated. These management measures, and rationale for retaining or deleting each measure, are described in more detail in the Plan Formulation Appendix, in Chapter 2, "Management Measures," Section "Increase Anadromous Fish Survival," within Section "Measures to Address Primary Planning Objectives."

Make Additional Modifications to Shasta Dam for Temperature Control This measure consisted of determining if making additional structural modifications to the outlets and existing TCD for temperature control is possible and feasible and, if so, implementing those modifications. This measure was retained for further development primarily because it could (1) improve the performance of the existing facility, (2) complement other measures under consideration to raise Shasta Dam, and (3) complement measures to improve aquatic spawning habitat in the Sacramento River. This management measure was further developed during the comprehensive plans phase and included as one of the eight common management measures, as the "Modify Temperature Control Device" measure, included in all action alternatives. The eight common management measures are described in EIS Chapter 2, "Alternatives," in Section 2.3.1, "Management Measures Common to All Action Alternatives."

Enlarge Shasta Lake Cold-water Pool This measure consisted of enlarging the cold-water pool by either raising Shasta Dam and enlarging the minimum operating pool, or increasing the seasonal carryover storage in Shasta Lake. This measure was retained for further development primarily because it would (1) directly contribute to both primary planning objectives for the SLWRI, (2) combine favorably with other measures, and (3) have a high certainty of providing the intended benefits once implemented. Further, the CALFED Preferred Program Alternative recommended project specific study of expanding CVP storage in Shasta Lake to increase the pool of cold water available to maintain lower Sacramento River temperatures needed by certain fish and provide other water management benefits, such as water supply

reliability. This management measure was further developed during the comprehensive plans phase and included as one of the eight common management measures included in all of the action alternatives. The eight common management measures are described in EIS Chapter 2, "Alternatives," in Section 2.3.1, "Management Measures Common to All Action Alternatives." At a minimum, all comprehensive plans include enlarging the cold-water pool by raising Shasta Dam to enlarge Shasta Reservoir. Some alternatives also increase the seasonal carryover storage in Shasta Lake. This measure is discussed in Chapter 2 of the EIS in Section 2.3, "Action Alternatives."

Modify Storage and Release Operations at Shasta Dam This measure consisted of enlarging Shasta Dam and modifying seasonal storage and releases to benefit anadromous fisheries. Although this measure could help provide greater flexibility in meeting water temperature targets, it would be aimed primarily at improving flows and influencing physical channel conditions for anadromous fish. This measure was initially deleted from consideration because analyses indicated a decreased fisheries benefit with increasing Sacramento River flows compared to increasing the cold-water pool. However, this measure was later retained for further development when combined with additional storage space in Shasta Reservoir, as part of an adaptive management plan, primarily because it could directly contribute to both primary objectives of the SLWRI and combine favorably with other measures. Further, the CALFED Preferred Program Alternative recommended project specific study of expanding CVP storage in Shasta Lake to increase the pool of cold water available to maintain lower Sacramento River temperatures needed by certain fish and provide other water management benefits, such as water supply reliability. This measure was further developed during comprehensive plans phase and was incorporated into CP4 and CP4A as the component "Adaptive Management of Cold-Water Pool." This measure is discussed further in Chapter 2 of the EIS in Section 2.3, "Action Alternatives."

Transfer Existing Shasta Reservoir Storage from Water Supply to Cold-water Releases This measure, requested as part of the environmental scoping process, consisted of reoperating the existing Shasta Dam and Reservoir for anadromous fishery resources. For this measure, it was assumed that storage space in Shasta Reservoir could be reoperated to provide flows similar to those identified in the January 2001 *Final Restoration Plan* for the Anadromous Fish Restoration Program. Although a portion of the cold-water releases could be diverted downstream for water supply, the overall effect would be a reduction in agricultural and M&I water supply deliveries. This measure was deleted from further consideration primarily because it violates at least one of the planning criteria concerning the potential to adversely impact existing project purposes, by reducing existing water supplies for

agricultural and M&I deliveries. Further, this measure would adversely impact the primary objective related to increasing agricultural and M&I water supply reliability.

Remove Shasta Dam and Reservoir This measure, requested as part of the environmental scoping process, consisted of removing the existing Shasta Dam and Reservoir to benefit anadromous fishery resources. The removal of Shasta Dam and Reservoir was deleted from further consideration primarily because it violates at least one of the planning criteria concerning the potential to adversely impact existing project purposes. Although the potential benefit to anadromous fish resources along the upper Sacramento River could be sizeable, these benefits are outweighed by the monetary benefit associated with the existing project. No known project or projects could replace the benefits provided by Shasta and Keswick dams, reservoirs, and appurtenant facilities at any price.

Improve Fish Migration The following management measures to improve fish migration were evaluated. These management measures, and rationale for retaining or deleting each measure, are described in more detail in the Plan Formulation Appendix, in Chapter 2, "Management Measures," Section "Increase Anadromous Fish Survival," within Section "Measures to Address Primary Planning Objectives."

Screen Diversions on Old Cow and South Cow Creeks This measure consisted of screening diversion intakes in the Cow Creek watershed to reduce fish mortality. This measure was deleted from further development primarily because it is independent of hydraulic/hydrologic conditions in the upper Sacramento River, would not improve ecological conditions or fish habitat along the mainstem Sacramento River, and, therefore would not directly contribute to increasing anadromous fish survival within the primary Sacramento River study area. Further, the ERP has evaluated, prioritized, and funded ecosystem restoration actions identified in the CALFED Preferred Program Alternative. This measure and similar activities were encompassed in the ERP action related to modifying or eliminating fish passage barriers, including the removal of some dams, construction of fish ladders, and construction of fish screens that use the best available technology.

Remove or Screen Diversions on Battle Creek This measure consisted of removing or screening diversions and other water control facilities on Battle Creek to allow full use of the watershed's high-quality, cold-water spawning habitat. This measure was deleted from further development primarily because it is independent of hydraulic/hydrologic conditions in the upper Sacramento River, would not improve ecological conditions or fish habitat along mainstem Sacramento River, and,

therefore would not directly contribute to increasing anadromous fish survival within the primary Sacramento River study area. Further, the ERP has evaluated, prioritized, and funded ecosystem restoration actions identified in the CALFED Preferred Program Alternative. This measure and similar activities were encompassed in the ERP action related to modifying or eliminating fish passage barriers, including the removal of some dams, construction of fish ladders, and construction of fish screens that use the best available technology.

Construct a Migration Corridor from the Sacramento River to the Pit River This measure consisted of providing passage to spawning areas upstream from Shasta Dam for anadromous fish from the Sacramento River. This measure and similar measures were initially deleted from further consideration during earlier phases of the SLWRI primarily because of (1) the high cost for complex infrastructure, (2) major impacts to other facilities and extensive long-term operation and maintenance requirements, and (3) high uncertainty for the potential to achieve and maintain successful fish passage and spawning. However, Reclamation is currently studying volitional fish passage above Shasta Dam under a separate Federal program as the result of the 2009 NMFS BO. For more information, please see Master Comment Response FISHPASS-1, "Fish Passage Above Shasta Dam."

Reoperate the CVP to Improve Overall Fish Management – This measure, which was requested as part of the environmental scoping process, primarily included reoperating all of the CVP facilities in the upper Sacramento River system to improve anadromous fish resources. This measure was deleted from further consideration in the SLWRI primarily because no opportunity appears to exist to effectively further reoperate the CVP facilities capable of affecting the Sacramento River that would not result in adversely impacting other project purposes.

Construct a Fish Ladder on Shasta Dam This measure primarily included constructing a fish ladder on Shasta Dam to allow anadromous fish to access Shasta Lake and approximately 40 miles of the upper Sacramento River, about 24 miles of the lower McCloud River, and various small creeks and streams tributary to Shasta Reservoir. This measure was initially deleted from further consideration during earlier phases of the SLWRI primarily because of the estimated high cost to construct and operate the fish ladder and potential inability for fish to successfully ascend the ladder. However, Reclamation is currently studying volitional fish passage above Shasta Dam under a separate Federal program as the result of the 2009 NMFS BO. For more information, please see Master Comment Response FISHPASS-1, "Fish Passage Above Shasta Dam."

Reintroduce Anadromous Fish to Areas Upstream from Shasta Dam
This measure, which was requested as part of the environmental scoping process, primarily included non-volitional fish passage above Shasta Dam, involving trapping anadromous fish along the upper Sacramento River likely just downstream from Keswick Dam, transporting the fish by tanker truck, and releasing the fish in the Sacramento River upstream from Shasta Lake or the McCloud River to spawn. It also included some method of trapping potential out-migrating fish and transporting them to the Sacramento River near Keswick for release into the lower river. This measure was deleted from further consideration in the SLWRI primarily because non-volitional fish passage above Shasta Dam to the upper Sacramento and McCloud rivers is being studied under a separate Federal program as the result of the 2009 NMFS BO. For more information, please see Master Comment Response FISHPASS-1, "Fish Passage Above Shasta Dam."

Additional Measures Benefiting Anadromous Fish In addition to the measures considered within the Section "Increase Anadromous Fish Survival," as described above, other measures were considered that would also benefit anadromous fish resources in the Upper Sacramento River. These are described in The Plan Formulation Appendix in Chapter 2, "Management Measures" under "Conserve, Restore, and Enhance Ecosystem Resources." Of these measures, the following measure was retained for further development.

Restore Riparian and Floodplain Habitat Along the Sacramento River
This measure consisted of restoring riparian and floodplain habitat at specific locations along the Sacramento River to promote the health and vitality of the river ecosystem. This measure was retained for further consideration primarily because it would have a high likelihood of success in accomplishing effective restoration and would indirectly benefit aquatic habitat conditions for anadromous fish. Further, the ERP has evaluated, prioritized, and funded ecosystem restoration actions identified in the CALFED Preferred Program Alternative. This measure and similar activities were encompassed in the ERP action related to protecting, restoring, and managing diverse habitat types representative of the Bay-Delta and its watershed, (which includes the Sacramento River and its tributaries). This measure was further developed during the comprehensive plans phase and was included within the plan component "restoring riparian, floodplain, and side channel habitat in the upper Sacramento River," which was incorporated into CP4, CP4A, and CP5. This component is discussed further in Chapter 2 of the EIS in Section 2.3, "Action Alternatives."

33.3.6 Master Comment Response for Alternative Selection

ALTS-1 – Alternative Selection

Comments were received during the public comment period included concerns about the alternative selection (e.g., identification of the preferred alternative and Clean Water Act Section 404 compliance). In addition to the discussion below, please see Master Comment Responses ALTD-1, "Alternative Development – Water Supply Reliability," and ALTD-2, "Alternative Development – Anadromous Fish Survival," related to measures considered during the plan formulation process to address water supply reliability and anadromous fish survival. Also, please see Master Comment Response P&N-1 "Purpose and Need and Objectives" related to the development of the SLWRI purpose and need and objectives and ALTR-1, "Range of Alternatives," which describes NEPA requirements for alternatives development, the relationship of SLWRI to CALFED, and development of the SLWRI alternatives.

Alternative Selection Chapter 32, "Final EIS," describes the rationale for the selection of the preferred alternative, which is CP4A. The preferred alternative is the alternative which the agency believes would fulfill its statutory mission and responsibilities, giving consideration to economic, environmental, technical and other factors.

As described in Chapter 32, "Final EIS," the environmentally preferable alternative will be identified in the ROD. The Environmentally Preferable Alternative, as explained by the CEQ's "Forty Questions" as "the alternative that will promote the national environmental policy as expressed in NEPA's Section 101(42 USC § 4331). Generally, this means the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources." The concept of the agency's preferred alternative is different from the environmentally preferable alternative, although in some cases one alternative may be both the preferred alternative and the environmentally preferable alternative.

As described in Chapter 32, "Final EIS," Reclamation will seek an Individual Permit according to the requirements of 33 CFR 325.1, including a Section 404(b)(1) alternatives analysis and mitigation plan after the issuance of the ROD. To comply with CFR Part 230 Section 404(b)(1) guidelines, the USACE can only issue a permit for the Least Environmentally Damaging Practicable Alternative (LEDPA). Pursuant to NEPA, the USACE is a Cooperating Agency for this EIS. Reclamation has coordinated with USACE during development of the EIS.

33.3.7 Master Comment Responses for Air Quality and Climate Change

AQ-1 – Offsetting Greenhouse Gas Emissions with Increased Hydropower

Every action alternative would generally increase the volume of water stored in Shasta Lake and therefore the amount of electricity that can be produced by the hydropower facility at Shasta Dam. The analysis of greenhouse gas (GHG) emissions under Impact AQ-6 in Chapter 5, "Air Quality and Climate," assumed that the increase in hydropower production would reduce the need for fossil fuel-based generation and associated GHG emissions. Some commenters questioned this assumption or requested additional clarification. Some commenters also suggested that it would be equally reasonable to assume that some of the electricity would be produced by renewable sources such as solar and wind. However, the assumption used in the GHG analysis is reasonable given the superior cost-effectiveness of generating base load electricity with natural gas or other fossil fuels, as well as the regulatory context related to the California Global Warming Solutions Act of 2006 (Assembly Bill 32) and particularly California's Renewable Electricity Standard (RES). First, most of the baseload of electricity generation serving California comes from fossil fuel plants, nuclear plants, or hydroelectric power facilities because these are the most economical methods of producing electricity in the open market and because these forms of power generation, unlike solar and wind, can operate consistently and predictably on a long-term basis (i.e., 24 hours per day, 365 days a year). Second, RES essentially requires that 33 percent of the state's electricity come from eligible sources of renewable power by 2020 but the hydropower produced at Shasta Dam does not meet all the eligibility requirements necessary to qualify as renewable in the regulatory context of RES—most notably because its capacity exceeds 30 MW (CEC 2013: p. 27). Thus, because hydropower generated by the project is not eligible for Renewables Portfolio Standard (RPS) it cannot be argued that this power would replace power from generation sources that are RPS-eligible (e.g., solar, wind, geothermal). For these reasons, it is reasonable to assume that an increase in hydropower production at Shasta Dam would replace fossil fuel-generated power and therefore result in a GHG benefit.

AQ-2 – Loss of Carbon Sequestration and Carbon Sequestration Potential

The commenter criticizes the GHG analysis for not accounting for the fact that future carbon sequestration will not be generated by the vegetation that would be removed in the areas that would be inundated by water. The commenter is correct that the analysis does not differentiate between the loss of sequestered carbon during removal of vegetation and the loss of future sequestration potential from trees and

vegetation being removed before they could reach their maximum carbon storage potential (i.e., trees removed before reaching maturity). Instead of dividing the estimate of lost carbon sequestration into the two parts—the loss that would occur at the time the vegetation is removed and the loss if future potential sequestration—the analysis provides a conservative estimate of the loss of sequestered carbon with a simple calculation. The analysis assumed that the rate of carbon sequestration would be approximately 426 metric tons of carbon dioxide equivalent emissions (MT CO_2e) per acre of vegetation removal for all the action alternatives. For instance, it was estimated that the loss of sequestered carbon from removal of vegetation from 370 acres under Comprehensive Plan 1 (CP-1) would amount to a total 157,778 MT CO_2e and this value amortized over the 50-year life of the project would be 3,156 MT CO_2e/year.

As stated in Chapter 5, "Air Quality and Climate," Section 5.3.4, "Direct and Indirect Effects," (Page 5-43) of the DEIS, the calculation of sequestered carbon loss is conservative because it assumes that all of the inundated area is forested with stands of species that sequester relatively high quantities of carbon. Another reason the calculations used in the analysis are conservative is because they did not account for fact that much of the removed timber would continue to sequester carbon in the form of various wood products. Other analyses of carbon sequestration loss from timber removal projects in California estimate that 68 to 70 percent of merchantable wood volume would be converted to forest products (James, Krumland, and Eckert 2007; p. 29.).

The rate of carbon sequestration loss of 426 MT CO_2e/acre used in the analysis is also considered to be conservative when compared to the sequestration rates recommended in Air Resources Board's (ARB) Compliance Offset Protocol for USFS Projects (ARB 2013). In its protocol, ARB estimates that the Common Practice sequestration rates for forests in the Southern Cascades range from 49 to 128 MT CO_2e/acre. The rates are 70 to 88 percent lower than the rate used in the DEIS.

AQ-3 – Potential for Greenhouse Gas Emissions Generated by the Decomposition of Soil and Vegetative Material in the Expanded Reservoir

Vegetation management activities, including the clearing of trees and other vegetation from select areas around the reservoir, would be completed before inundation of new areas created by enlarging the reservoir, as explained in Chapter 2, "Alternatives," Section 2.3.8, "Comprehensive Plan Construction Activities," (page 2-64) of the DEIS.

Increased GHG emissions from decomposition of remaining vegetation in areas with partial or no clearing are discussed in DEIS Chapter 5, "Air

Quality and Climate." In summary, the loss of vegetation presently in the area that would be inundated would likely result in a loss of CO_2 absorption by that vegetation, as well as increased emissions of decomposing material present in the lake as a result of increased volume. There may be some offset to this effect with increased surface area of Shasta Lake for absorption. These effects are speculative and infeasible to quantify at this time.

In its Climate Action Plan, DWR provides a useful and insightful summary of the current state of the science on whether water storage reservoirs in California, such as Shasta Lake, result in increased GHG emissions associated due to the decomposition or organic material (DWR 2012):

> *Several research studies have indicated that the surfaces of some reservoirs may be emitting or absorbing GHGs at material rates as a result of diffusion of CO_2 and CH_4 from the water into the atmosphere or from the atmosphere into the water. In addition, as stored water passes through hydroelectric turbines GHGs that had been dissolved in the water come out of solution and are released to the atmosphere. These types of emissions could represent sources or sinks of emissions from DWR's facilities; however, there are several factors that are not yet fully understood and that make it difficult to adequately quantify emissions rates from DWR's storage facilities.*
>
> *These factors have been identified in both the absorption and emission of GHGs from reservoirs and other aquatic systems. In general, organic inputs, soil type and vegetation inundated, water quality parameters (dissolved oxygen, CO_2, and CH_4, temperature, pH), and duration of inundation have all been found to affect the GHG absorption and emissions characteristics of aquatic systems.*
>
> *In addition to these factors, natural aquatic systems have been shown to be the primary pathway in the global carbon cycle for transmitting carbon sequestered at the watershed level back to the atmosphere, into sediment deposition, or as dissolved carbon to the oceans (Cole et al., 2007). Thus, even if emissions from the surface and tailraces of reservoirs could be accurately quantified, it would not be clear if the emission of GHGs by the reservoir was changing the actual flux of emissions or if the reservoir was only*

> *changing the temporal or spatial absorption and release of those emissions. Because rivers are significant GHG emissions pathways, it would be necessary to compare pre-reservoir watershed emissions with post-reservoir watershed emissions to determine the effect of the reservoir.*
>
> *Without extensive research and monitoring of DWR's facilities, DWR can rely only on existing data on similar facilities to estimate the impact of its facilities. Fifty-nine hydropower reservoirs, natural lakes, and rivers in the western and southwestern U.S. have been sampled to date (Soumis et al., 2004). This sampling shows that some reservoirs in California, Oregon, and Washington are GHG sinks while others have gross emissions equal to or less than natural lakes and rivers of the region (Tremblay et al., 2005). These studies suggest that net GHG emissions from [State Water Project] reservoirs are not substantial and are likely no higher than pre-development conditions.*

Reclamation believes that the state of the science on this question for its reservoirs in California, including Shasta Lake, is identical to the above findings by DWR.

Furthermore, on the international level, questions about the consistency of measurement and estimation techniques used to evaluate GHG emissions from reservoirs have culminated in a joint publication of the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the International Hydropower Association (IAH) titled *GHG Measurement Guidelines for Freshwater Reservoirs* (UNESCO and IAH 2010). The primary objective of the *Guidelines* is to promote scientifically rigorous field measurement campaigns, and the evaluation of the net change in GHG emissions, from a representative set of freshwater reservoirs across the world. Potential important GHG pathways for CO_2 and CH_4 addressed by the *Guidelines* include ebullition (bubbling), diffusive fluxes from the reservoir surface, diffusion through plant stems, degassing just downstream from reservoir outlets, and increased diffusive fluxes along the river course downstream. Also of potential importance is the degree to which algae and vascular aquatic plants in reservoirs serve as a carbon sink and whether nitrification and denitrification processes in reservoirs result in a measurable nitrous oxide pathway. The *Guidelines* address the fact that there is little scientific consensus about the degree to which freshwater reservoirs contribute GHGs to the atmosphere. The *Guidelines* focuses on methodologies used to collect data in the field to better understand these pathways, including requirements regarding

sample size, measurement precision, spatial resolution (both horizontally and vertically), timing/seasonality, selection of sites for reference measurements, demarcation of a reservoir's drawdown zone, water quality parameters, requirements of gas analyzers and gas measurement technologies, standardization of units, and quality assurance and quality control procedures.

UNESCO/IHA will review all field data collection techniques to recognize compliance with the *Guidelines*. Data collected using the *Guidelines* will be used to develop predictive modeling tools for assessing the GHG status of unmonitored reservoirs and to develop general guidance for mitigating GHG emissions for sites that generate a high increase in net GHG emissions. Thus, such predictive modeling tools—that could potentially be used to support a NEPA or California Environmental Quality Act analysis—are not fully developed and therefore are not available at this time.

In light of all of these considerations, the DEIS does not attempt to quantify the net change in GHG emissions from the expansion of Shasta Lake or from the tailraces of its hydroelectric facilities. Thus, GHG emissions that were quantified in the DEIS do not include emissions from the expansion of the Shasta Lake or its hydroelectric facilities and impacts associated with GHG generation and Climate Change were found to be less than significant, as described in Chapter 5, "Air Quality and Climate." The comprehensive literature reviews conducted by both DWR and UNESCO/IHA suggest that attempting a quantitative analysis of these potential emission sources at this time would involve a high degree of speculation and uncertainty. That said, a change in emissions could occur in relation to this topic area due to implementation of the proposed action and alternatives. However, the reservoir is currently flooded and only a small portion of additional land would be inundated with project implementation. In addition, much of that land is currently highly disturbed upland habitat. This habitat does include vegetation that could decompose to result in additional GHG emissions, but it is important to note this vegetation is considered low density in its current state. Therefore, given the small area and the low density of vegetation, the potential increase in GHG emissions, though uncertain, is likely to be slight.

AQ-4 – Greenhouse Gas Emissions Associated with Cement Production

Comments were received relating to potential emissions associated with cement and concrete used to raise Shasta Dam. For this analysis, Reclamation has chosen to estimate and consider direct and indirect GHG emissions associated with the various action alternatives, and not attempt to quantify emissions associated with the manufacture of cement. Direct emissions are caused by the action itself, such as

emissions associated with the construction of a building whereas indirect emissions are also caused by an action but are removed from the action in either time or space, such as tailpipe emissions from construction worker vehicles. There are multiple reasons the analysis did not attempt to quantify emissions associated with the cement and concrete used in project construction, as described below.

First, the analysis did not attempt to perform a lifecycle analysis for the GHG emissions of each Comprehensive Plan. Emissions associated with the manufacturing of building materials are sometimes referred to as "embodied emissions" rather than direct or indirect emissions. Embodied emissions are included in life cycle assessments that attempt to account for many levels emissions-generating activities associated with an action or product. The challenge of presenting a lifecycle analysis is that there is much dissimilarity in determining the "boundary" or limits of that analysis. For instance, in a lifecycle assessment of concrete, the emissions used to operate equipment at a cement quarry would likely be included but the emissions associated with workers commuting to the quarry or the "upstream" emissions associated with any purchased solid fuels that are used for pyroprocessing may not be included. The broader the boundary of the life cycle analysis, the more speculation and uncertainty are introduced.

Draft NEPA guidance from the CEQ speaks to this reality as follows (CEQ 2010: 4 to 5):

> *Inherent in NEPA and the CEQ implementing regulations is a "'rule of reason,' which ensures that agencies determine whether and to what extent to prepare an EIS based on the usefulness of any new potential information to the decision-making process." DOT v. Public Citizen, 541 U.S. 752, 767 (2004). Where a proposed action is evaluated in either an EA or an EIS, the agency may look to reporting thresholds in the technical documents cited above as a point of reference for determining the extent of direct GHG emissions analysis that is appropriate to the proposed agency decision. As proposed in draft guidance above, for Federal actions that require an EA or EIS the direct and indirect GHG emissions from the action should be considered in scoping and, to the extent that scoping indicates that GHG emissions warrant consideration by the decision maker, quantified and disclosed in the environmental document. 40 CFR 1508.25. In assessing direct emissions, an agency should look at the consequences of actions over which it has control or authority.*

No government agency explicitly recommends conducting lifecycle analyses or suggests the quantification of embodied emissions in NEPA or CEQA analyses.

Another reason the analysis did not attempt to quantify embodied GHG emissions associated with the use of cement is that the cement industry is subject to California's Cap-and-Trade Program. The Cap-and-Trade Program covers major sources of GHG emissions in the State such as refineries, power plants, industrial facilities—including cement plants—and transportation fuels. The Cap-and-Trade Program includes an enforceable emissions cap that will decline over time. The state distributes allowances, which are tradable permits, equal to the emissions allowed under the cap. Sources under the cap, including cement plants, will need to surrender allowances and offsets equal to their emissions at the end of each compliance period (ARB 2012: pp. 13). Because emissions associated with cement production are already being addressed and controlled by the Cap-and-Trade Program, the analysis in the DEIS focused on the level of emissions associated with off-road equipment use and on-road vehicle use (i.e., haul truck trips, worker commute trips).

The approach used in the GHG analysis follows guidance that has been developed by various state agencies for CEQA documents because guidance of similar detail has not been developed by EPA, the CEQ, Reclamation, or other federal agencies.

33.3.8 Master Comment Responses for Costs vs. Benefits

COST/BEN-1 – Intent of EIS and Process to Determine Federal Interest

Several comments raised concerns over the estimated benefits and costs of the action alternatives. Some comments reflected concerns that the costs of the alternatives outweighed the potential benefits.

DEIS Chapter 1, "Introduction," Section 1.5, describes the "Intended Use of EIS." The purpose of an EIS is not to recommend approval or rejection of a project, but to describe the beneficial and adverse effects on the human environment of a proposed action and a reasonable range of alternatives. The SLWRI DEIS provides a full and fair discussion of significant environmental impacts (40 CFR 1502.1) through the evaluation of reasonable range of alternatives which could feasibly achieve the purpose and need to aid the public and decision makers and permitting agencies in the decision-making process. For further information related to NEPA compliance, please see Master Comment Response NEPA-1, "Sufficiency of EIS."

Consistent with 40 CFR 1502.23, a monetary cost-benefit analysis was not included in the DEIS or Final EIS. As stated in 40 CFR 1502.23:

> *…the weighing of the merits and drawbacks of the various alternatives need not be displayed in a monetary cost-benefit analysis and should not be when there are important qualitative considerations. In any event, an environmental impact statement should at least indicate those considerations, including factors not related to environmental quality, which are likely to be relevant and important to a decision.*

Consistent with this guidance, although a monetary cost-benefit analysis was not included in the EIS because it is not required under NEPA, costs and non-monetized benefits for action alternatives were included in the DEIS and this Final EIS to provide additional basis and context for weighing the merits and drawbacks of alternatives. Estimated costs and potential non-monetary benefits of SLWRI action alternatives are presented in the EIS Engineering Appendix, Attachment 1, "Cost Estimates for Comprehensive Plans," and EIS Chapter 2, "Alternatives," Section 2.3, "Action Alternatives." The DEIS provides a full and fair discussion of beneficial and adverse environmental effects of action alternatives.

Consistent with P&G, a monetary cost-benefit analysis was performed and is presented in the Final Feasibility Report. So while the neither the DEIS or Final EIS includes monetary cost-benefit analyses, which is not required by NEPA, such an analysis was performed consistent with federal guidelines and is included in the Final Feasibility Report.

The Final Feasibility Report, together with this Final EIS, and supporting documents will be submitted by the Secretary of the Interior to Congress. Congress may take one or more of the following actions: (1) approve of the recommendations of the Secretary of the Interior, with or without further modifications; (2) approve the No-Action Alternative; (3) delay decisions and request additional information from the Secretary of the Interior; (4) authorize construction of the approved action via appropriate legislation, and, (5) appropriate funds via separate legislation.

COST/BEN-2 – Comments Related to the SLWRI Feasibility Report

Several comments were received that appear to be directly related to the SLWRI Draft Feasibility Report and related evaluations, which is not within the scope of the DEIS. Accordingly, these comments are not the subject of the public review process at this time, and a response to these comments is not required under NEPA because the comment does not raise a significant issue with the NEPA document (NEPA Regulations

40 CFR Part 1503.4(b)). Examples of these comments include comments related to feasibility evaluations presented in the Draft Feasibility Report.

The SWLRI Draft Feasibility Report had a separate public review and comment process. Reclamation released the Draft Feasibility Report and Preliminary DEIS to the public in February 2012 to share information generated since the completion of the SLWRI Plan Formulation Report in December 2007 and to provide additional opportunity for public and stakeholder input. This February 2012 release was followed by an October 2012 Reclamation news release requesting additional public comment on the Draft Feasibility Report for input on potential cost, benefits and impacts of enlarging Shasta Dam and Reservoir. Public comments on the Draft Feasibility Report were accepted through December 28, 2012. Comments received on the Draft Feasibility Report were considered in development of documentation and evaluations in the DEIS, this Final EIS, and the Final Feasibility Report.

The SLWRI Final Feasibility Report and related Economic Valuation Appendix and Cost Allocation Appendix were released concurrently with this Final EIS. Since the release of the Draft Feasibility Report in 2012, SLWRI action alternatives and related evaluations were further refined based several factors, including updates to CVP and SWP operational assumptions and stakeholder input. This is described in the DEIS and Final EIS in Chapter 2, "Alternatives," Section 2.1.6, "Development and Refinement of Comprehensive Plans," and Chapter 3, "Considerations for Describing Affected Environment and Environmental Consequences," Section 3.2.3, "Methods and Assumptions." As described in the DEIS and Final EIS, water operations modeling and related evaluations were updated to reflect the following:

- 2008 Long-Term Operation BA
- USFWS 2008 Formal Endangered Species Act Consultation on the Proposed Coordinated Operations of the CVP and SWP (2008 USFWS BO)
- 2009 NMFS BO
- Additional changes in CVP and SWP facilities and operations, such as implementation of the San Joaquin River Restoration Program
- Additional changes in non-CVP/SWP facilities and operations, such as the addition of the Freeport Regional Water Project

The alternatives evaluated and CVP and SWP operational assumptions in the Final EIS are the same as those in the Final Feasibility Report and related appendices. Accordingly, operational assumptions in the Final Feasibility Report reflect the 2008 Long-Term Operation BA, 2008 USFWS BO, and 2009 NMFS BO.

Comments provided during the DEIS public comment period related to the Draft Feasibility Report will be considered in the development of evaluations and documentation for the Final Feasibility Report. The Final Feasibility Report, together with this Final EIS, and supporting documents will be submitted by the Secretary of the Interior to Congress for potential construction authorization and related appropriations.

COST/BEN-3 – Increased Water Supply Reliability under Action Alternatives

Several comments stated that SLWRI action alternatives will not increase water supply reliability or decrease unmet contract amounts.

Estimated potential increases in water supply reliability under SLWRI action alternatives are described in in the DEIS in Chapter 2, "Alternatives," Section 2.3, "Action Alternatives," and summarized in Section 2.5, "Summary of Potential Benefits of Action Alternatives." As described in the DEIS, SLWRI action alternatives would increase water supply reliability by increasing water supplies for CVP and SWP irrigation and M&I deliveries. Estimated increases in water supply deliveries under SLWRI action alternatives reduce the previously unmet CVP contract and SWP Table A amounts. Estimated increases in dry and critical year water supplies for irrigation and M&I deliveries under SLWRI action alternatives range from about 47,300 acre-feet (for CP1) to about 113,500 acre-feet (for CP5). Estimated increases in average annual deliveries under SLWRI action alternatives range from about 31,000 acre-feet (for CP1) to about 75,900 acre-feet (for CP5).

Water supply reliability benefits of each action alternative were estimated using standard methodologies that are consistent with the current regulatory framework, using CalSim-II, which is the best available tool for evaluating system-wide water operations throughout the Central Valley. CalSim-II is the standard operations model used for CVP/SWP systems analysis, including in EISs prepared by Reclamation. For information related to the CalSim-II model and related assumptions used for evaluations in the EIS, please see EIS Chapter 6, "Hydrology, Hydraulics, and Water Management," Section 6.3.1, "Methods and Assumptions," and the Modeling Appendix, Chapter 2, "CalSim-II." No other comparable tools have been suggested by commenters.

COST/BEN-4 – Non-monetary Benefits of Action Alternatives
Several comments sought clarification on the potential benefits of the action alternatives.

Potential non-monetary benefits of SLWRI action alternatives, are described in the DEIS in Chapter 2, “Alternatives,” Section 2.3, "Action Alternatives." Under SLWRI action alternatives, the additional storage in Shasta Reservoir would allow an increase in water supply reliability and expansion of the cold-water pool for downstream anadromous fisheries. Enlarging Shasta Reservoir would increase the depth and volume of the cold-water pool, increasing the ability of Reclamation to release cold water from Shasta Dam and regulate seasonal water temperatures for fish in the upper Sacramento River. This could improve water temperature and flow conditions, increasing anadromous fish survival in the upper Sacramento River. SLWRI action alternatives would also increase water supply reliability for agricultural, M&I, and environmental purposes and help reduce future water shortages, primarily during drought periods (see Master Comment Response COST/BEN-3, “Increased Water Supply Reliability under Action Alternatives”).

Other potential benefits of SLWRI action alternatives that contribute to meeting project objectives include the following:

- Increased capacity in Shasta Reservoir for capture of high flood flows
- Increased hydropower generation
- Conservation, restoration, and enhancement of ecosystem resources in the Sacramento River
- Improved Delta water quality and Delta emergency response capability
- Increased recreation opportunities at Shasta Lake

Quantified estimates of non-monetized benefits under SLWRI action alternatives were based on modeling efforts that are described in several parts of the DEIS. Increased water supply reliability was estimated using CalSim-II, which is described in EIS Chapter 6, “Hydrology, Hydraulics, and Water Management,” Section 6.3.1, “Methods and Assumptions,” and the Modeling Appendix, Chapter 2, “CalSim-II.” Increased anadromous fish survival was estimated using SALMOD, Version 3.8 (based on inputs from CalSim-II and water temperature modeling), which is described in EIS Chapter 11, “Fisheries and Aquatic Resources,” Section 11.3.1, “Methods and Assumptions,” and the

Modeling Appendix, Chapter 5, "Anadromous Fish Production Simulation (SALMOD)." Increased hydropower generation was estimated using the LongTermGen, Version 1.18, and SWP Power, BST April 2010 Version, modeling tools for the CVP and SWP, respectively, which are described in Chapter 23, "Power and Energy," Section 23.3.1, "Methods and Assumptions, and Modeling," and Modeling Appendix Chapter 8, "Hydropower Modeling." The methodology used to estimate increased recreation user days is described in the Modeling Appendix Chapter 10, "Recreational Visitation."

COST/BEN-5 – Potential Project Financing

Several comments were related to CVP financing topics and/or the SLWRI Draft Feasibility Report potential funding analyses, which are outside the scope of the EIS, and therefore does not require a response under NEPA (40 CFR 1503.4(b)). Some of these comments directly referred to the Draft Feasibility Report and the corresponding Draft Economic Valuation Appendix (which were released to the public in February 2012), not the 2013 DEIS. Other comments were directed toward the DEIS, but were on financial topics outside the scope of the SLWRI or on topics related to the Feasibility Report, that were not included in the DEIS because they were not required under NEPA. These financial topics include historical CVP repayment policies, potential water beneficiaries' payment capacities, and SLWRI preliminary cost allocation. As described in Master Comment Response COST/BEN-2, "Comments Related to the SLWRI Feasibility Report," evaluations in the SLWRI Final Feasibility Report, including preliminary cost allocation and potential water beneficiaries' payment capacities, will be updated based on alternatives refinements and updated operational assumptions included in the DEIS. Comments provided on the Draft Feasibility Report and related evaluations were considered in the development of evaluations and documentation for the Final Feasibility Report.

33.3.9 Master Comment Responses for Engineering and Design

ENG-2 – Borrow Materials

During the public comment period, comments were received regarding the potential sources of borrow material that would be used for construction during the raising of Shasta Dam.

As described in the DEIS Engineering Summary Appendix, Chapter 3, "Design Considerations for Dam and Appurtenances of Dam Enlargements," multiple borrow sources are available to meet project needs. Material availability would vary with market demand and production restrictions, but it is expected that sufficient materials will be available when needed for construction. Table 3-17 in the DEIS Engineering Summary Appendix lists the quantities and type of borrow

material that would be most restrictive for the dam raise and facility relocations (e.g., materials required for dike construction). Borrow sources could include: (1) commercial sources, and (2) borrow areas developed on Federal lands. Borrow areas on Federal lands could include areas of the dike construction sites, areas located below the reservoir's inundation zone, and other Federal lands within the reservoir area. The volume of material includes the amounts that may be supplied by commercial sites. Any commercial source would need to meet all applicable local, state, and federal regulatory requirements. In the DEIS Appendices Engineering Summary, Appendix Plate 25 shows potential locations for both private/commercial sources and sources located on federal lands. The Final EIS includes clarification about the potential use of Federal lands in the reservoir area.

The proposed Moody Flats Quarry is not on Federal lands and is still in the preliminary phases of environmental documentation (EIR is under development), and accordingly, it was not identified as a borrow source for the project. However, in response to public comment and information recently made available by the project proponents, the Moody Flats Quarry is included in the cumulative effects analysis and is described in Final EIS Chapter 3, "Considerations for Describing Affected Environment and Environmental Consequences," Section 3.2.9, "Cumulative Effects," Further, Moody Flats Quarry is included in the cumulative effects analysis within related resources chapters of the Final EIS (Chapters 4 through 25), as appropriate.

33.3.10 Master Comment Responses for General

GEN-1 – Comment Included as Part of the Record

Many comment authors expressed personal opinions, histories or experiences which are not appropriately addressed as part of the NEPA process. A response to this type of comment is not required under NEPA because the comment does not raise a significant environmental issue (40 CFR 1503.4). This comment will be included as part of the record and made available to decision makers before a final decision on the proposed action.

GEN-2 – Unsubstantiated Information

The information provided by the comment author in the comment is not known to Reclamation and could not be found through library database queries, internet research and research in the Reclamation data archives. The EIS did rely on the best available science to support the NEPA analysis and absent any additional information to substantiate this comment, no further response is required.

GEN-4 – Best Available Information

NEPA requires that agencies ensure the professional integrity, including scientific integrity, of the discussions and analyses in environmental impact statements; identify any methodologies used and make explicit reference by footnote to the scientific and other sources that were relied upon for conclusions in the statement. An agency may place discussion of methodology in an appendix (40 CFR 1502.24).

Reclamation, through the scoping process and discussions with agencies and stakeholders, has performed information gathering and focused studies to document resource conditions and evaluate the potential impacts of the range of alternatives developed through the SLWRI feasibility study. The tools used to evaluate impacts of the alternatives were selected based upon Reclamations standard practices, procedures, directives, and policies, and input from agencies and subject matter experts. DEIS Chapter 29, "List of Preparers," lists the people and disciplines involved in the preparation of the DEIS including engineers, geologists, biologists, cultural resources specialists, architects, and economists.

Methodologies used in the analysis of the effects of the alternatives are documented in each resource chapter of the EIS (Chapters 4 through 25) under the subsection "Methods and Assumptions." Additional details of the methods used to evaluate the alternatives are located in the various Appendices to the EIS, where there are full descriptions of the methods, their derivation, uncertainties, and how they are used to support the analyses within the EIS. Primary models/tools used in the evaluation of SLWRI alternatives are shown in Table 33.3-2. All methods used were the best available for the analyses to be performed.

Table 33.3-2. Primary Models Used in the Analysis of the Effects of Action Alternatives

Analysis Area	Model	Primary Description in EIS	Appendix
Water Supply – CVP/SWP Operations	CalSim-II	Chapter 6, "Hydrology, Hydraulics, and Water Management"	Modeling Appendix Chapter 2, "CalSim-II"
Water Quality – Delta Water Quality	Delta Simulation Model 2 (DSM2)	Chapter 6, "Hydrology, Hydraulics, and Water Management" & Chapter 7, "Water Quality"	Modeling Appendix Chapter 7, "Delta Hydrodynamic Model"
Water Quality – River and Reservoir Temperature	Sacramento River Water Quality Model (SRWQM)	Chapter 7, "Water Quality"	Modeling Appendix Chapter 4, "Sacramento River Water Quality Model"
Fisheries – Anadromous Fish Production	Anadromous Fish Production Simulation (SALMOD)	Chapter 11, "Fisheries and Aquatic Resources"	Modeling Appendix Chapter 5, "Anadromous Fish Production Simulation"

Table 33.3-2. Primary Models Used in the Analysis of the Effects of Action Alternatives (contd.)

Analysis Area	Model	Primary Description in EIS	Appendix
Power – Hydropower Generation and Consumption (CVP)	LongTermGen (LTGen)	Chapter 23, "Power and Energy"	Modeling Appendix Chapter 8, "Hydropower Modeling"
Power – Hydropower Generation and Consumption (SWP)	State Water Project Power (SWPPower)	Chapter 23, "Power and Energy"	Modeling Appendix Chapter 8, "Hydropower Modeling"
Economics – Regional Agricultural Production and Economic Optimization	Statewide Agricultural Production Model (SWAP)	Chapter 16, "Socioeconomics, Population, and Housing"	Modeling Appendix Chapter 6, "Statewide Agricultural Production Model"
Economics – Regional Economics	IMpact analysis for PLANning model (IMPLAN)	Chapter 16, "Socioeconomics, Population, and Housing"	Modeling Appendix Chapter 9, "Regional Economic Impact Modeling"
Geology – Geomorphology	Shoreline Erosion Conceptual Model	Chapter 4, "Geology, Geomorphology, Minerals, and Soils"	Geologic Technical Report Attachment 1, "Shoreline Erosion Technical Memorandum"
Air Quality – Emissions	California Emissions Estimator Model (CalEEMod)	Chapter 5, "Air Quality and Climate"	Air Quality Technical Report Attachment 1, "Air Quality and Greenhouse Gas Modeling Results"
Air Quality – Emissions	Motor Vehicle Emission Factor Model (EMFAC)	Chapter 5, "Air Quality and Climate"	Air Quality Technical Report Attachment 1, "Air Quality and Greenhouse Gas Modeling Results"
Air Quality – Emissions	OFFROAD	Chapter 5, "Air Quality and Climate"	Air Quality Technical Report Attachment 1, "Air Quality and Greenhouse Gas Modeling Results"
Air Quality – Emissions	Sacramento Metropolitan Air Quality Management District's (SMAQMD) Road Construction Emissions Model	Chapter 5, "Air Quality and Climate"	Air Quality Technical Report Attachment 1, "Air Quality and Greenhouse Gas Modeling Results"
Watershed Erosion	Watershed Erosion Prediction Project (WEPP)	Chapter 7, "Water Quality"	-

Key:
CVP = Central Valley Project
SWP = State Water Project

Quality Control/Peer Reviews for SLWRI EIS Quality control reviews were conducted for this Final EIS to verify that documentation and related evaluations meet Reclamation's quality requirements and

comply with applicable laws, regulations, and sound technical practices of the disciplines involved. These reviews included independent peer reviews by Reclamation, Cooperating Agency, and other State and Federal agency technical/resource area experts; targeted Reclamation reviews; and routine quality reviews during development of technical evaluations and documentation.

Reclamation technical/resource area experts conducted independent peer reviews of documentation and related evaluations throughout the development of the EIS, including the DEIS and Final EIS. Similar peer reviews were also conducted for appropriate resource areas by members of Cooperating Agencies and other State and Federal agencies. During these reviews, documentation and related evaluations were reviewed for:

- Compliance with established laws, policies, regulations, and other appropriate guidance
- Adequacy of the scope of the document
- Appropriateness of all planning, engineering, design, and environmental assumptions and methods
- Appropriateness of data used, including level of detail
- Appropriateness of alternatives evaluated
- Accuracy
- Comprehensiveness
- Reasonableness of results

Reclamation has also conducted targeted reviews of evaluations and documentation in the EIS, including:

- A Design, Engineering, and Construction (DEC) Review of designs and cost estimates for SLWRI action alternatives and a follow-up DEC Special Assessment to verify completion of DEC Review recommendations.
- A Policy Compliance Review of the Final EIS and Final Feasibility Report to ensure that all applicable policy requirements and directives have been addressed.

In addition, reviews were performed routinely during development of EIS technical evaluations and documentation. Routine technical analysis reviews were conducted by subject matter experts and included (1) review of tool selection, (2) review of tool assumptions and inputs, (3)

review of tool outputs, and (4) review of modeling results and interpretation. Routine documentation reviews included independent review by subject matter experts to confirm agreement with scope, appropriateness of assumptions and methodology, accuracy of data and findings, interpretation of findings, and that conclusions were supported by information presented.

GEN-5 – Some People Support Dam Raise and Others Oppose Dam Raise

Reclamation acknowledges that there are many people who support raising the dam and there are many who maintain that the dam should remain unchanged. There are a range of reasonable alternatives presented in the EIS which have been refined from the November 2011 Draft Feasibility Report; six of which are examined in detail using the best available science. Reclamation recognizes that there are positive and negative aspects for each of these alternatives. The potential effect of each alternative is discussed in the EIS and will be fully considered by the decision-maker, along with public input before making a final recommendation. Also any modifications to the dam or facilities will require Congressional authorization as well as refinements to design, obtaining permits, and fulfilling mitigation requirements.

GEN-7 – Rules and Regulations for Water Operations Under Action Alternatives

Water operations under SLWRI action alternatives are described in DEIS in Chapter 2, "Alternatives," Section 2.3, "Action Alternatives." As described, Shasta Dam is operated in conjunction with other CVP facilities and SWP facilities to manage floodwater, storage of surplus winter runoff for irrigation in the Sacramento and San Joaquin valleys, M&I use, maintenance of navigation flows, protection and conservation of fish and other beneficial uses in the Sacramento River and Delta, and generation of hydroelectric energy. The SLWRI No-Action Alternative and action alternatives would not include changes to any rules and regulations that govern operations at Shasta Dam in the form of flow requirements, water quality requirements, and water supply and hydropower commitments.

SLWRI alternatives would not supersede existing laws or regulations and would not exempt any actions from compliance with applicable laws, including NEPA or Federal Endangered Species Act (ESA). SLWRI alternatives would not increase existing maximum CVP or SWP contract quantities or expand the place of use. Similarly, SLWRI action alternatives would not modify existing priorities for water supply deliveries. The power generated by the CVP is marketed through contracts with the Western Area Power Administration (Western). Changes in Western’s priorities are not anticipated to change under SLWRI action alternatives.

SLWRI action alternatives would, however, include potential for modification to existing operational guidelines or rule curves for flood control at Shasta Dam and Reservoir. However, these changes would primarily be to accommodate physical modifications of action alternatives, such as increased dam height. Although the volume of the flood control pool would remain the same as under existing operations (1.3 MAF), the bottom of the flood control pool elevation would likely be increased based on increased dam height and reservoir capacity. The rule curves would be revised with the goal of reducing flood damage and enhancing other objectives to the extent possible.

The Federal, State, and local regulatory framework for the SLWRI is generally described in Chapter 3, "Considerations for Describing Affected Environment and Environmental Consequences," Section 3.4, "Regulatory Framework," of the DEIS. Chapters 4 through 25 contain more detailed discussions of the "Regulatory Framework" by resource area. In addition, Chapter 26, "Other Required Disclosures," further describes the Federal and State laws, rules and regulations, Executive Orders, and compliance requirements that may be required if an alternative is selected for implementation.

GEN-8 – Public Outreach and Involvement

Comments received during the public comment period included remarks on the public release of the DEIS, meetings with local governments, and the public hearing process.

General Public Outreach and Involvement 40 CFR 1506.6(a,d) states:

- "Agencies shall make diligent efforts to involve the public in preparing and implementing their NEPA procedures;"
- "Agencies shall solicit appropriate information from the public."

Reclamation consulted and coordinated with various public agencies, organizations, and Native American Tribal Groups during the public outreach process and throughout the development of the SLWRI DEIS to obtain feedback on SLWRI, including, but not limited to, the USFS; Colusa Indian Community Council of the Cachil Dehe Band of Wintun Indians; USACE; U.S. Department of the Interior, Bureau of Indian Affairs (BIA); USFWS; NMFS; DWR; California Department of Fish and Wildlife (CDFW); and the Winnemem Wintu.

In addition, other public outreach activities included workshops, presentations, project briefings, and project update meetings (including

those with property owners and/or business interest in the Shasta Lake area).

For additional information on consultation and coordination, see Chapter 27, "Public Involvement, Consultation, and Coordination," Section 27.4, "Consultation and Coordination."

DEIS Public Review 40 CFR 1506.6 states, "Agencies shall provide public notice of NEPA-related hearings, public meetings, and the availability of environmental documents so as to inform those persons and agencies who may be interested or affected" and 40 CFR 1506.10(c) states "…agencies shall allow not less than 45 days for comments on draft statements."

The DEIS was released on July 1, 2013, for public and agency review and comment for a 90-day period that ended September 30, 2013. The document's Notice of Availability (NOA) was posted by U.S. Environmental Protection Agency (EPA) in the July 1, 2013, *Federal Register*.

Reclamation met and exceeded the 45-day mandatory time limit. For more information, please see the Master Comment Response COMMENTPERIOD-1, "Comment Period."

Public Hearings NEPA regulations 40 CFR Section 1506.6(c) states:

> *"Agencies shall hold or sponsor public hearings or meetings whenever appropriate or in accordance with statutory requirements applicable to the agency."*

Consistent with NEPA requirements, three public hearings were held in diverse geographical areas (Los Banos, Redding and Sacramento) to allow potentially affected communities to provide comments on the DEIS. These public hearings occurred before the close of the public comment period. Before the public hearings, Reclamation issued a news release to its statewide media list and posted advertisements in newspaper of record for each community, which were the Los Banos Enterprise, Redding Record-Searchlight and The Sacramento Bee.

The public hearings were held September 11, 12, and 13, 2013, in Sacramento, Los Banos and Redding, respectively. The total number of people that signed in for the meetings was 9, 5, and 138, respectively.

Cooperating Agencies 40 CFR 1501.6 states "Upon request of the lead agency, any other Federal agency which has jurisdiction by law shall be a cooperating agency. In addition any other Federal agency which has special expertise with respect to any environmental issue, which should be addressed in the statement, may be a cooperating

agency upon request of the lead agency. An agency may request the lead agency to designate it a cooperating agency."

Cooperating agencies on the DEIS include the USFS, Colusa Indian Community Council of the Cachil Dehe Band of Wintun Indians; USACE; and BIA.

For additional information on public outreach and involvement, see Chapter 27, "Public Involvement, Consultation, and Coordination," and Chapter 32, "Final EIS," Section 32.2, "Public Involvement for the SLWRI EIS."

COMMENTPERIOD-1 – Comment Period

In accordance with NEPA review requirements, the DEIS was circulated for public and agency review and comment for a 90-day period, from July 1, 2013 to September 30, 2013, after the EPA published the notice of availability in the Federal Register. The 90-day review period was twice the required 45 day review period. Written comments from the public, reviewing agencies, and stakeholders were accepted during the public comment period. Similar to the approach to public scoping, public hearings were held in various locations statewide to solicit and receive public input on the DEIS. These hearings were held during the public comment period and recorded by a certified court reporter so that any comments received at the hearings were addressed in the Final EIS. All written comments received on the DEIS, and all verbal comments received during the public meetings and by September 30, 2013 are fully considered and addressed. The DEIS is available on-line through the Reclamation website, as well as available at 6 local public libraries, and Reclamation's office in Sacramento and Washington, D.C.

MAILINGLIST-1 – Addition to the Mailing List

Thank you for the contact information, the SLWRI mailing list has been updated.

33.3.11 Master Comment Responses for Noise and Vibration

NOISE-1 – Traffic Noise Analysis

The traffic noise analysis is provided DEIS Chapter 8, "Noise and Vibration," Section 8.3.4, "Direct and Indirect Effects," under the heading *Off-Site Construction Traffic* on page 8-27 under Impact Noise-1 (CP1). A more comprehensive traffic noise analysis is provided here to address the multiple comments that raised concerns about the evaluation of traffic noise levels that would occur during project construction.

This additional analysis focuses on whether project-generated construction-related traffic would cause traffic noise levels to exceed

local transportation noise standards. It specifically addresses noise from traffic traveling to and from the dam site where construction activity would be the most intense, attract the most trips, and take place for the longest period of time. Because the primary access routes between the dam site and Interstate 5, including Shasta Dam Boulevard (State Route 151) and Lake Boulevard (Road 418), travel through the City of Shasta Lake, the analysis applies the transportation noise standards that have been established by the city. The city's transportation noise standards are provided in Table N-1 of the City of Shasta Lake General Plan (City of Shasta Lake 1999:24), which is reproduced below. The previous analysis used a generally acceptable method for construction noise. However, due to the comments received, this additional analysis has been done using specific standards. This approach is more comprehensive than the simpler approach presented in the DEIS (beginning on page 8-27) which focused solely on whether construction-related traffic noise increases along any affected roadways would be noticeable (i.e., 3 A-weighted decibels [dBA or dB] or greater). The City of Shasta Lake has not established any standards regarding the relative increase in noise due to a project, even for long-term increases that would occur for an indefinite period of time.

Table 33.3-3. Noise Sensitivity Standards

New Land Use	Outdoor Activity Area (L_{dn} dBA)	Interior Activity Area (L_{dn}/Peak Hour L_{eq} dBA)[1]	Notes
All Residential	60 – 65	45	2, 3, 4
Transient Lodging	65	45	5
Hospitals & Nursing Homes	60	45	6
Theaters & Auditoriums	—	35	
Churches, Meeting Halls, Schools, Libraries, etc.	60	40	
Office Buildings	65	45	7
Commercial Buildings	65	50	7
Playgrounds, Parks, etc.	70	—	
Industrial Facilities	65	50	7

Source: City of Shasta Lake General Plan 1999

Notes:

[1] For traffic noise within the City of Shasta Lake, Ldn and peak-hour Leq values are estimated to be approximately similar. Interior noise level standards are applied within noise-sensitive areas of the various land uses, with windows and doors in the closed positions.

[2] Outdoor activity areas for single-family residential uses are defined as back yards. For large parcels or residences with no clearly defined outdoor activity area, the standard shall be applicable within a 100 foot radius of the residence.

[3] For multi-family residential uses, the exterior noise level standard shall be applied at the common outdoor recreation area, such as at pools, play areas or tennis courts. Where such areas are not provided, the standards shall be applied at individual patios and balconies of the development.

[4] Where it is not possible to reduce noise in outdoor activity areas to 60 dB Ldn or less using a practical application of the best-available noise reduction measures, an exterior noise level of up to 65 dB Ldn may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table.

[5] Outdoor activity areas of transient lodging facilities include swimming pool and picnic areas.

[6] Hospitals are often noise-generating uses. The exterior noise level standards for hospitals are applicable only at clearly identified areas designated for outdoor relaxation by either hospital staff or patients.

[7] Only the exterior spaces of these uses designated for employee or customer relaxation have any degree of sensitivity to noise.

While the city's noise standards were established for the evaluation of new noise-sensitive receptors, they are the only quantitative noise standards established by the city and are similar to the standards established by Shasta County, Tehama County, and other local jurisdictions in California for evaluating transportation noise (e.g., Tables 8-7, 8-8, and 8-10 in the DEIS). Thus, the criteria listed in Table N-1 are used to evaluate increased noise levels that would result from construction-related traffic.

Quantitative traffic noise modeling was also conducted consistent with the U.S. Department of Transportation, Federal Highway Administration's Traffic Noise Model (FHWA 2006) and, therefore, takes into account potentially important attributes including the proportion of traffic that consists of automobiles, medium trucks, and heavy trucks to account for the relatively higher noise levels generated by haul trucks; the speed of travel; and the distance between noise-sensitive receptors and the roadway. As necessary, separate modeling runs were conducted for different segments of the same roadway to account for changes in these attributes.

In addition, the baseline traffic volume data used in the modeling are representative of the year 2012, which is the most recent year for which Caltrans provides data at the time of writing this response (Caltrans 2014). This distinction is important because traffic volumes for 2012 are generally higher than the 2006 traffic volumes used in the DEIS, and, therefore, result in higher traffic noise levels.

Lastly, the traffic volume increases resulting from project construction that are used in the modeling are consistent with the trip generation values provided in Chapter 20, "Transportation and Traffic," of the DEIS, which are higher than the trip generation rates discussed in Chapter 8, "Noise and Vibration." According to Chapter 20, "Transportation and Traffic," of the DEIS, the highest number of worker commute trips would be generated under CP-3, at 700 one-way trips per day, and the highest number of haul truck trips to and from the dam site would occur under CP-4, at 350 one-way trips per day. To conduct a conservative analysis that addresses all the CPs, the combination of these two values was used in the traffic noise modeling of baseline-plus-construction conditions. Results of the traffic noise modeling for both baseline and baseline-plus-construction conditions are summarized in the table below.

Table 33.3-4. Summary Exterior Traffic Noise Levels (L_{dn}, dBA)[1]

Roadway Segment	Baseline	Baseline Plus Construction
Lake Boulevard from Shasta Dam to Shasta Dam Boulevard	58.6	63.9
Shasta Dam Boulevard from Shasta Dam to Lake Boulevard	41.0	53.7
Shasta Dam Boulevard from Lake Boulevard to Toyon Neighborhood	56.6	62.1
Shasta Dam Boulevard from Toyon Neighborhood to Southern Pacific Railroad	58.2	62.6
Shasta Dam Boulevard from Southern Pacific Railroad to Ashby Road couplet	59.9	62.8
Shasta Dam Boulevard from Ashby Road couplet to Front Street/Hardenbrook Avenue	57.5	61.1
Shasta Dam Boulevard from Front Street/Hardenbrook Avenue to Cascade Boulevard	62.3	64.1
Shasta Dam Boulevard from Cascade Boulevard to Interstate 5	61.7	63.0
Roadway Segments Near Schools	**Baseline**	**Baseline Plus Construction**
Lake Boulevard along Mountain Lakes High School and Shasta Lake Elementary School[3]	53.0	59.8
Shasta Dam Boulevard along Mountain Lakes High School and Shasta Lake Elementary School[3]	46.8	54.5

Source: Modeling conducted by Ascent Environmental, Inc. 2014.

Notes:

[1] Refer to Traffic Noise Modeling Appendix for detailed modeling input parameters and output results.

[2] For both the segment of Lake Boulevard between Shasta Dam and Shasta Dam Boulevard and the segment of Shasta Dam Boulevard between Shasta Dam and Lake Boulevard, it was conservatively assumed that all trips generated by construction activity at the dam site would use these roadway segments, to be conservative.

[3] Separate modeling was conducted for the portions of Lake Boulevard and Shasta Dam Boulevard that pass along Mountain Lakes High School and Shasta Lake Elementary School where the posted speed limit is 25 mph. This modeling also accounted for the specific distance between the school buildings or their outdoor activity areas and the modeled roadway.

Key:

dBA =A-weighted decibels

L_{dn} = day-night noise level

As shown in the table, construction-related traffic would not result in traffic noise levels that exceed 65 dBA day-night noise level (L_{dn}) at receptors along any of the modeled roadway segments. Thus, traffic noise levels during project construction would not exceed the noise sensitivity standards established by the City of Shasta Lake for residential land uses or commercial land uses (Table 33.3-3). Reclamation recognizes that the city's noise standard for residential land uses consists of a range of 60 to 65 dBA L_{dn}; however, given that construction phase would not last for an indefinite period of time, it is reasonable to apply the 65 dBA L_{dn} to make a significance determination. This approach is consistent with the maximum allowable noise exposure standards established by Shasta County for transportation noise which state, "Where it is not possible to reduce noise in outdoor activity areas to 60 dBA L_{dn} per community noise equivalent level (CNEL) or less using a practical application of the best-available noise

reduction measures, exterior noise levels of up to 65 dBA L_{dn}/CNEL may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table" (See Table 8-7 on page 8-17 in Chapter 8, "Noise and Vibration," in the DEIS). This approach is also consistent with Shasta County's "conditionally acceptable" noise standards for transportation noise shown in Table 8-8 on page 8-18 of the DEIS, as well as the "conditionally acceptable" noise-compatibility guidelines recommended by the Governor's Office of Planning and Research shown in Table 8-4 on page 8-13 of the DEIS. Also shown in the table, estimated traffic noise levels along the segments of Lake Boulevard and Shasta Dam Boulevard that pass Mountain Lakes High School and Shasta Lake Elementary School would not exceed 60 dBA L_{dn}, which is the criterion established by the City of Shasta Lake for schools. Assuming the average exterior-to-interior noise level reduction of 20 dBA provided by wood frame buildings with the windows closed (Caltrans 2011a:H-17), the interior noise levels at roadside residential and commercial buildings would not exceed the city's interior noise standard of 45 dBA L_{dn}. Similarly, the interior noise levels at the schools would not exceed the city's interior noise standard of 40 dBA L_{dn} at the two schools. For these reasons, levels of traffic noise exposure under all five action alternatives would not exceed any of the exterior or interior noise standards established by the City of Shasta Lake.

For analysis about whether truck passbys would result in sleep disturbance, see Master Comment Response NOISE-2, "Intermittent Single-Event Noise Levels from Trucks Passing Off-Site Sensitive Receptors."

NOISE-2 – Intermittent Single-Event Noise Levels from Trucks Passing Off-Site Sensitive Receptors

Several comments raised issues about the potential impact of noise generated by haul trucks transporting materials to and from various construction sites, particularly the potential for the noise generated by single haul truck passbys to result in sleep disturbance during the more noise-sensitive nighttime hours at residences located along haul routes.

In addition to increases in average daily traffic noise, intermittent Single-Event Levels (SEL) and increases in the frequency of occurrence of such levels would be of additional concern, particularly during the more noise-sensitive nighttime hours. Although the average daily noise descriptors (i.e., L_{dn} and CNEL) incorporate a nighttime weighting or "penalty" that is intended to reflect the expected increased sensitivity to noise at night, L_{dn} and CNEL standards do not fully protect residents from sleep disturbance. The SEL describes a receiver's cumulative noise exposure from a single impulsive noise event (e.g., an automobile passing by or an air craft flying overhead), which is a rating of a discrete

noise event that compresses the total sound energy of the event into a 1-second time period, measured in decibels (Caltrans 2011a:D-20).

The City of Shasta Lake, Shasta County, Tehama County, and the Governor's Office of Research and Planning, as well as most cities and counties have not established noise level standards for the effects of single-event noise. However, following the court decision in *Berkeley Keep Jets Over the Bay Committee v. Board of Port Commissioners of the City of Oakland, 2001* there has been increased attention to the evaluation of single-event noise levels and their effects on sleep. Because the *Berkeley* case involved aircraft, and the SLWRI would involve construction-related haul truck trips, the situations are not entirely the same. Nonetheless, the SELs from truck passbys associated with construction under the SLWRI are evaluated here.

Many studies have been conducted regarding the effects of single-event noise on sleep disturbance, but due to the wide variation in the reaction of test subjects to SELs of various levels no definitive consensus has been reached with respect to a universal criterion to apply. Upon a review of studies about sleep disturbance and aircraft-generated SELs, the Federal Interagency Committee on Aviation Noise (FICAN) provided estimates of the percentage of people expected to be awakened when exposed to specific SELs inside a home (FICAN 1997). According to the FICAN's review, 10 percent of the population is estimated to be awakened when the SEL interior noise level is 81 dBA. An estimated 5 to 10 percent of the population is affected when the SEL interior noise level is between 65 and 81 dBA, and few sleep awakenings (less than 5 percent) are predicted if the interior SEL is less than 65 dBA. However, FICAN did not recommend a threshold of significance based on the percent of people awakened.

The threshold for sleep disturbance is not absolute because there is a high degree of variability from one person to another. Thus, the means of applying such research to land use decisions is not completely clear. As a result, no government agency has suggested what frequencies of awakenings are acceptable (Caltrans 2011a:4-10). For these reasons, the Federal Interagency Committee on Noise , the Governor's Office of Research and Planning, and most as most cities and counties (including the City of Shasta Lake, Shasta and Tehama counties), continue to use L_{dn} or CNEL as the primary tool for the purpose of land use compatibility planning (Caltrans 2011a:4-9, 4-13). In fact, the L_{dn} and CNEL represents the cumulative exposure to all single events, that is, the exposure of all SELs taken together, weighed to add penalties for nighttime occurrences, and averaged over a 24-hour period. Thus, it can be argued that the L_{dn}/CNEL standards established by Shasta County, which are shown in Table 8-7 on page 8-17 (Chapter 8, "Noise and Vibration," Section 8.3.4, "Direct and Indirect Effects") of the DEIS, or

the City of Shasta Lake's L_{dn} standards, as shown in Master Comment Response NOISE-1, "Traffic Noise Analysis," already account for the individual impacts associated with the SELs. (Note that CNEL and L_{dn} are often used interchangeably, as there is only a subtle difference in noise level penalties during evening hours used to formulate the two metrics.)

Because the *Berkeley* case drew concerns due to interior SEL values in excess of 65 dBA, this analysis uses a similar threshold of 65 dBA SEL within residences. Exposure to 65 dBA SEL would result in a chance of sleep disturbance of less than 5 percent.

Reference SELs for heavy truck passbys were measured by Bollard Acoustical Consultants and reported in an EIR for a proposed commercial center (City of Ceres 2010:4.10-10). The results of the measurements indicated that heavy truck passby levels ranged from 77 to 85 dBA SEL, with a mean of 83 dBA SEL at a reference distance of 50 feet.

Assuming the average exterior-to-interior noise level reduction of 20 dBA provided by wood frame buildings with the windows closed (Caltrans 2011a:H-17), the maximum SEL in the interior of rooms located closer than 50 feet from a passing truck would exceed 65 dBA SEL. As discussed under Impact Noise-1 and in Master Comment Response NOISE-1, "Traffic Noise Analysis," transport of equipment, aggregate, and other materials to and from construction areas would be performed by haul trucks that may pass by residential dwelling units and other noise-sensitive receptors. Affected receptors would include the houses on Shasta Dam Boulevard (State Route 151) between Interstate 5 and the dam site, as well as the houses along the segments of Lake Boulevard (Road 418) both north and south of Shasta Dam Boulevard. Because some of the houses along these routes have inhabitable rooms located closer than 50 feet to the roadway, these rooms would experience SELs that exceed the threshold of 65 dBA and, therefore, the percentage of people expected to be awakened when inside the affected homes would exceed 5 percent. As a result, this impact would be significant. This conclusion is consistent with the less-than-significant impact conclusion determined Impact Noise-1 in the DEIS. To reduce this impact to a less-than-significant level, Mitigation Measure Noise-1 and accompanying text is revised as follows.

Under Mitigation Measure Noise-1 (CP1), "Implement Measures to Prevent Exposure of Sensitive Receptors to Temporary Construction Noise at Project Construction Sites," Reclamation and its primary construction contractors will implement the measures listed below during construction:

- Construction activities producing high impact noise at non-dam sites will be limited to the less noise-sensitive daytime hours (7 a.m. to 10 p.m., Monday through Friday). Nighttime (10 p.m. to 7 a.m.) construction activities at non-dam sites noise levels shall not exceed county standards.

- All contractors and subcontractors shall be specific in their contracts and purchase orders for equipment, gravel, aggregate, and other building supplies, as well as for debris removal, that all truck deliveries and debris removal trips that use roadways that pass within 50 feet of inhabitable rooms of residential dwellings shall be limited to the less noise-sensitive daytime hours (7 a.m. to 10 p.m.). Applicable roadways where nighttime truck travel shall be prohibited include the segment of Shasta Dam Boulevard (State Route 151) between Interstate 5 and Lake Boulevard (Road 415) and/or the segments of Lake Boulevard immediately north and south of Shasta Dam Boulevard.

- All construction equipment and staging areas will be located at the farthest distance feasible from nearby noise-sensitive land uses.

- All construction equipment will be properly maintained and equipped with noise-reduction intake and exhaust mufflers and engine shrouds, in accordance with manufacturers' recommendations. Equipment engine shrouds will be closed during equipment operation.

- All motorized construction equipment will be shut down when not in use to prevent idling.

- A temporary barrier will be placed as close to the noise source or receptor as possible and will break the line of sight between the source and receptor.

- A disturbance coordinator will be designated and the person's telephone number conspicuously posted around the project sites and supplied to nearby residences. The disturbance coordinator will receive all public complaints and be responsible for determining the cause of the complaint and implementing any feasible measures to alleviate the problem.

Implementation of Mitigation Measure Noise-1, as revised above, would reduce temporary project generated construction source noise levels and limit them to the less sensitive daytime hours, thus preventing exposure of sensitive receptors to temporary construction noise at dam and non-

dam sites. Implementation of this mitigation measure would also eliminate exposure of off-site residential uses to truck-generated SELs that would cause substantial levels of sleep disturbance. As a result, Impact Noise-1 would be reduced to a less-than-significant level for all the action alternatives.

In addition, for sake of consistency, text in Chapter 20, "Traffic and Transportation," Section 20.3.1, "Methods and Assumptions," (page 20-25) of the DEIS is revised as follows.

Construction would typically occur during daylight hours Monday through Friday, but the construction contractor may extend the hours and may schedule daytime construction work on weekend days with the approval of Reclamation. The average workday would be 8 hours.

33.3.12 Master Comment Responses for Cost Estimates

COSTEST-1 – Development of Cost Estimates

During the public comment period, comments were received regarding the cost estimates and the various components that contributed to their development. Some comments questioned the use of contingencies and time periods applied for the cost of the comprehensive plans. Several comments were related to specific items in the cost estimates, such as real estate and demolition costs, the gravel augmentation program, and increased public service costs.

Overall cost estimates for each alternative can be found in the DEIS, Engineering Summary Appendix, Attachment 1, "Cost Estimates for Comprehensive Plans." Detailed cost estimates for action alternative can be found in the DEIS Engineering Summary Appendix, Attachment 2, "6.5-Foot Raise and Reservoir Area Infrastructure Cost Estimates," Attachment 3, "12.5-Foot Raise and Reservoir Area Infrastructure Cost Estimates," and Attachment 4, "18.5-Foot Raise and Reservoir Area Infrastructure Cost Estimates." As described in DEIS Engineering Summary Appendix, Chapter 5, "Opinion of Probable Construction Cost," significant features were included separately related to (1) the dam and reservoir and (2) relocations. The cost estimates were intended to capture the most current pricing for materials, wages and salaries; accepted productivity standards; and typical construction practices, procurement methods, current construction economic conditions, and site conditions for the current level of design.

As stated in the DEIS Engineering Summary Appendix, Chapter 5, "Opinion of Probable Construction Cost," total annual costs were estimated based on interest and amortization of the capital costs for 100 years at the current federal discount rate.

The DEIS Engineering Summary Appendix, Chapter 5, "Opinion of Probable Construction Cost," details the contingencies that are included according to Reclamation standards. Field costs, which are estimates of capital costs of features or projects, include mobilization, design contingency, allowance for procurement strategies, and construction contingencies. The amount of contingency varies based on the construction feature. Detailed cost estimates for SLWRI action alternatives, including contingencies for various construction features, can be found in the DEIS Engineering Summary Appendix, Attachments 2 through 4. Feasibility cost estimates have inherent risk associated with possible changes in market conditions and are subject to change. The cost estimates provided are based on normal market conditions and are not guaranteed. To identify the potential cost risks associated with the project Reclamation performed a Monte Carlo simulation using Oracle Crystal Ball software. The analysis was only performed for CP4 for demonstration of the cost risk, and additional information on the Monte Carlo Simulation can be found in the DEIS Engineering Summary Appendix Attachment 6 "CP4 Crystal Ball Estimate."

As stated in the DEIS Engineering Summary Appendix, Chapter 4, "Design Consideration for Reservoir Area Infrastructure Modifications and/or Relocations," costs for demolition of nonrecreation structures are included as part of the utilities and miscellaneous minor infrastructure cost estimate. Costs associated with demolition of recreation structures are included as part of the recreation facilities cost. Costs for demolition are not included as part of the real estate and land acquisition portion of the cost estimate for each alternative.

For the DEIS Real Estate Appendix, "Value Estimate," fee titles and permanent easements were assumed to be 80 percent of the high market value of a property. Reclamation has reviewed this assumption and has determined that a 100 percent of the high market value would be a more prudent value. The Final EIS has been updated to reflect the change fee title and permanent easements value assumption.

Costs for the gravel augmentation are included only for CP4, which focuses on anadromous fish survival with water supply reliability, and CP5, which has a combined focus on water supply reliability, anadromous fish survival, Shasta Lake area environmental resources, and increased recreation opportunities. The DEIS Chapter 2 "Alternatives," Section 2.3, "Action Alternatives," provides background on the gravel augmentation program included under CP4 and CP5 and a general description of gravel placement and related construction activities. The program would complement the CVPIA gravel augmentation program and be planned to avoid redundancy in the placement of gravel. As stated in the DEIS, the program would be

assessed after the initial 10-year period to assess the need for continued spawning gravel augmentation, and to identify opportunities for future gravel augmentation actions or programs.

The DEIS states in Chapter 21, "Utilities and Service Systems," under Impact Util-2 that Reclamation is committed to the funding and relocation of existing infrastructure and construction of replacement infrastructure, including localized wastewater treatment plants that might replace some individual septic systems. The costs for relocations of utilities and the proposed waste water collection systems have been included in cost estimates for action alternatives and can be found in DEIS Engineering Summary Appendix, Attachment 2, "6.5-Foot Raise and Reservoir Area Infrastructure Cost Estimates," Attachment 3, "12.5-Foot Raise and Reservoir Area Infrastructure Cost Estimates," and Attachment 4, "18.5-Foot Raise and Reservoir Area Infrastructure Cost Estimates."

The DEIS Engineering Summary Appendix, Chapter 5, "Opinion of Probable Construction Cost," describes the process used to develop cost estimates for demolition and construction. Unit prices were developed using a semi-detailed method and applied to the quantities developed from the feasibility-level designs. Contingencies for all cost estimates are included as described in the DEIS Engineering Summary Appendix, Chapter 5, "Opinion of Probable Construction Cost." Description of the non-contract costs used in the cost estimates are also described in the DEIS Engineering Summary Appendix Chapter 5, "Opinion of Probable Construction Cost," and include planning, engineering, design, construction management, land acquisition, environmental mitigation, cultural resources mitigation, and water use efficiency actions. These non-contract costs have been updated for the Final EIS.

Guidance in the development of the cost estimates comes from Reclamation Manual, Directives and Standards, Project Planning and Facility Operations, Maintenance, and Rehabilitation (FAC) 09-01, 09-02, and 09-03. FAC 09-01 describes specific levels of estimates along with the attributes of each, FAC 09-02 identifies how cost estimates are used in the development of the construction cost estimate and project cost estimate, and FAC 09-03 describes how various levels of cost estimates are to be used.

The DEIS cost estimates are at a feasibility level, which FAC 09-01 describes as follows:

> *Feasibility cost estimates are based on information and data obtained during investigations for pre-authorization activity. These investigations provide sufficient information to permit the preparation of*

> *preliminary layouts and designs from which the approximate quantities for each kind, type, or class of material, equipment, or labor may be obtained. These estimates are used to assist in the selection of a preferred plan, to determine the economic feasibility of a project, and to support seeking construction authorization from the Congress.*

To ensure that cost estimates were standardized and completed to the level described above, Reclamation performed a review by staff external to the SLWRI staff (e.g., independent review). The Design, Estimating, and Construction (DEC) Review process has been completed for all action alternatives.

The following Table 33.3-5 from FAC 09-01, displays the project status, stage, and level of cost estimates that correspond. The feasibility cost estimates fall in the Planning Stage. If a project is authorized by Congress, the authorized plan will move into the design phase where the designs and cost estimates will be further refined.

Table 33.3-5. Sequence of Development of Cost Estimates

Project Status	Project Stage	Level of Cost Estimate Period
Planning	Planning	Preliminary
		Appraisal
		Feasibility
Construction	Design	Percent Design (Updated Feasibility)
		Prevalidation of Funds
	Solicitation	Independent Government Cost Estimate (Award)
	Construction	Independent Government Cost Estimate for Contract Modifications
Operations and Maintenance	Operations	One or more of the previously identified estimates

COSTEST-3 – Costs for Marina Relocations

Several comments received during the public comment period expressed concern over the costs associated with the marina relocations and the possibility of marina facility reductions because of the proposed project.

As stated in the DEIS Chapter 2 “Alternatives,” Section 2.3.8, “Comprehensive Plan Construction Activities,” at a minimum, the existing recreation capacity around the lake would be maintained under all action alternatives. During construction, the scheduling and sequencing of the relocations would strive to minimize disruption to recreation facilities. Generally, marina relocations would take place on fill in place, upslope out of the inundation area. DEIS designs and cost

estimates for all action alternatives in the DEIS also provide for up to 50 percent of relocated structure square footage be moved to floating facilities. Road relocations would continue to provide access to the marinas during and after construction. The DEIS Engineering Summary Appendix, Chapter 4, "Design Consideration for Reservoir Area Infrastructure Modifications and/or Relocations," states that the USFS has not approved relocation sites or any plans for relocations. After the authorization of the project, further detailed design and analysis would take place.

For each of the action alternatives, relocation costs for recreational facilities were developed using the assumptions outlined in the DEIS Engineering Summary Appendix, Chapter 5, "Opinion of Probable Construction Cost." A semi-detailed method of developing unit costs was used to determine the costs of materials, construction activities, and demolition. Detailed cost estimates for the relocation of marinas can be found for each alternative in the DEIS Engineering Summary Appendix, Attachment 2, "6.5-Foot Raise and Reservoir Area Infrastructure Cost Estimates," Attachment 3, "12.5-Foot Raise and Reservoir Area Infrastructure Cost Estimates," and Attachment 4, "18.5-Foot Raise and Reservoir Area Infrastructure Cost Estimates. To identify the potential cost risks associated with the project Reclamation performed a Monte Carlo simulation using Oracle Crystal Ball software. The analysis was only performed for CP4 for demonstration of the cost risk, additional information on the Monte Carlo Simulation can be found in the DEIS Engineering Summary Appendix Attachment 6 "CP4 Crystal Ball Estimate."

As stated in the DEIS Engineering Summary Appendix, Chapter 4, "Design Consideration for Reservoir Area Infrastructure Modifications and/or Relocation," the USFS has not approved any relocation sites or any plans for relocations, and preliminary relocation plans were developed with USFS for the purposes of the DEIS. The goal of the preliminary plans was to verify that recreational capacity could be maintained, and if a project is authorized, further detailed designs and plans would be developed.

COSTEST-4 – Procurement and Construction Contract Requirements

Comments received during the public comment period expressed concern over procurement and construction contract requirements. As stated in the DEIS Engineering Summary Appendix, Chapter 5, "Opinion of Probable Construction Cost," the cost estimates were developed to capture the current pricing of materials, wages, and procurement strategies. All contracted labor for construction would be implemented under the current Federal Acquisition Guidelines Subpart 22.403 "Statutory and Regulatory Requirements."

33.3.13 Master Comment Responses for Cultural Resources

CR-1 – Potential Effects to Cultural Resources

Several comments reflect concerns regarding the loss of cultural resources, including archaeological, ethnographic, and historic sites, and places of traditional, sacred, and ceremonial use. In particular, several commenters expressed concerns that additional Winnemem Wintu sacred places would be inundated more frequently if the project moves forward.

The DEIS acknowledges concerns over the loss of cultural resources and identifies this as an area of controversy, as well as acknowledgement of no feasible mitigation for potential impacts to places of traditional and ceremonial use from the Action Alternatives. Chapter 1, "Introduction," Section 1.6, "Areas of Controversy," of the DEIS state that Native American concerns and cultural resources remain an area of controversy. Impacts from inundation of Traditional Cultural Properties and Sacred Land Filings ("Impact Culture-2") in Chapter 14, "Cultural Resources," Section 14.3.4, "Mitigation Measures," for "CP1," "CP2," "CP3," "CP4," and "CP5," are identified as significant and unavoidable, with no feasible mitigation identified.

Chapter 14, "Cultural Resources," of the DEIS outlines the methods used to identify cultural resources in the study area, the results of those efforts, and an assessment of potential effects of each proposed alternative with mitigation measures. Identification efforts included archival and records searches; ethnographic studies; discussions and meetings with Native American tribes, groups, and individuals; and site sensitivity analyses. These efforts resulted in the identification of the types of cultural resources present in the study area and estimations of the density and distributions of those resources. Information concerning potential Native American concerns was gathered from historic and ethnographic literature and from discussions with tribes and Native American individuals, and was incorporated into the DEIS in Chapter 14, "Cultural Resources," Section 14.1, "Affected Environment," and Section 14.3, "Environmental Consequences and Mitigation Measures." Cultural resources types addressed in comments, including places of continued and current importance and use for traditional, ceremonial, and sacred purposes by the Winnemem Wintu, are presented and discussed in the DEIS. Section 14.3, "Environmental Consequences and Mitigation Measures," presents the environmental consequences of each alternative on the types of cultural resources identified based on the context and intensity of the environmental effects that would be caused by, or result from, the proposed action. Mitigation for Action Alternatives includes resuming additional National Historic Preservation Act (NHPA) Section 106 consultations early in the planning process, should Congress authorize an Action Alternative, to avoid, minimize, or

mitigate effects when feasible, as discussed in Section 14.2.3 "Regulatory Compliance." Impacts from inundation of Traditional Cultural Properties and Sacred Land ("Impact Culture-2") in Section 14.3.4, "Mitigation Measures" for "CP1," "CP2," "CP3," "CP4," and "CP5," are identified as significant and unavoidable, with no feasible mitigation identified. The Final EIS will be revised to clarify this in Section 14.3.4 "Mitigation Measures," in Table 14-7 "Summary of Mitigation Measures for Cultural Resources" and in the text of that section.

CR-2 – Federal Recognition

Several commenters made remarks regarding past grievances with the Federal Government over Federal Recognition, treaties, and acts.

The Office of Federal Acknowledgment (OFA) within the Office of the Assistant Secretary – Indian Affairs of the Department of the Interior implements Part 83 of Title 25 of the CFR, Procedures for Establishing that an American Indian Group Exists as an Indian Tribe. The acknowledgment process is the Department's administrative process by which petitioning groups that meet the criteria are "acknowledged" as Indian tribes. To the extent any non-Federally recognized Native American group seeks Federal recognition, the proper forum is the OFA or Congress. *See also Winnemem Wintu Tribe v. Interior*, No. 2:09-cv-01072-FCD-KJN (E.D. Cal. 2010) (concluding that Federal recognition is a non-justiciable political question and denying plaintiffs' claim that the Government must Federally recognize them as an Indian Tribe). Reclamation has no authority or jurisdiction in the process of determining whether any group should be Federally recognized as an Indian Tribe.

To the extent commenters claim the right to land or compensation under the Treaty of Cottonwood Creek and the Act of July 30, 1941, 55 Stat. 612, the rights of any and all Indian tribes and allottees to property withdrawn for the purpose of creating Shasta Dam and Reservoir were extinguished. Section 1 of the Act "granted to the United States . . . all the right, title, and interest of the Indians in and to the tribal and allotted lands within the area embraced by the Central Valley project." To the extent any commenter seeks compensation for that transfer (and the inundation created by Shasta Dam) or a declaration that any such land remains tribal or allotted land, the SLWRI process is not the proper forum to seek redress. Further, Reclamation is unaware of any Indian lands, whether tribal or allotted land, that will be inundated by any of the alternatives to raise Shasta Dam, but were not previously transferred to the United States under the 1941 Act.

Other comments argue that the Shasta Reservoir Indian Cemetery, created through Section 4 of the 1941 Act, should be held in trust for the

benefit of the Winnemem Wintu or be dedicated to use by the same. Section 4 of the Act states that the cemetery "shall be held in trust by the United States for the appropriate tribe, or family, as the case may be." The cemetery is federal property that has been withdrawn from public entry and, by operation of law pursuant to the 1941 Act, it is held by the United States for appropriate Indian tribes and families. However, the United States has no specific fiduciary trust duties to Indian tribes and families with respect to the cemetery under the 1941 Act. *See United States v. Navajo Nation*, 537 U.S. 488, 506 (2003); *United States v. Mitchell*, 463 U.S. 206, 216-17, 19 (1983). Additionally, in *Winnemem Wintu v. Interior*, No. 2:09-cv-01072-KJM-KJN (E.D. Cal. 2012), the District Court denied the plaintiffs' request for a declaration that the Shasta Indian Cemetery be held in trust for the benefit of the Winnemem Wintu. The Winnemem Wintu have been and are permitted to use the Shasta Reservoir Indian Cemetery, but that does not mean that it is held in Indian trust for the benefit of the Winnemem Wintu or that they have the exclusive right to access and use the cemetery.

CR-3 – Current Effects to Cultural Resources

Several comments reflect concerns regarding current inundation of traditional sites under Shasta Reservoir due to the original construction of Shasta Dam.

Current conditions and impacts to cultural resources, including traditional use sites, are acknowledged and presented in Chapter 14 "Cultural Resources." The SLWRI evaluates the potential effects on cultural resources of implementing alternatives to modify the existing Shasta Dam and Reservoir. Section 14.3.3, "Direct and Indirect Effects," under "No-Action Alternative," acknowledges ongoing effects and states, under "Shasta Lake and Vicinity": "There may be ongoing impacts to cultural resources, but there is no responsibility to mitigate them. Mitigation is not required for the No-Action Alternative." This statement will be corrected in the Final EIS to clarify that no mitigation is required for the SLWRI alternatives under the No-Action Alternative as the proposed activities would not occur. Responsibilities to manage ongoing impacts may fall under other Federal or State laws which would be separate from the SLWRI requirements.

In Section 14.3.3, "Direct and Indirect Effects" for "CP1," "CP2," "CP3," "CP4," and "CP5," "Impact Culture-2," potential impacts to traditional cultural properties and places used for traditional practices are specifically identified and discussed with consideration given to increased impacts for each alternative combined with current impacts. Section 14.3.5, "Cumulative Effects," concludes that "While it may not be possible to predict all future impacts to cultural resources within the study area, it is clear that raising Shasta Dam would result in cumulative

effects on historic properties. Such properties have already been identified, and there are known ongoing effects."

CR-5 – Environmental Justice

Several comments indicated that the Winnemem Wintu should be considered a protected group under Environmental Justice.

The conclusions reached in Chapter 24 "Environmental Justice," Section 24.3.4, "Direct and Indirect Effects," are that while there are no disproportionately high or adverse effects on minority or low-income populations, there is a potential disproportionate high and adverse effect on Native American populations from disturbance or loss of sacred locations in the vicinity of Shasta Lake. Both the Winnemem Wintu and Pit River Madesi Band members attach religious and cultural significance to locations in the vicinity of Shasta Lake. Mitigation for these impacts is not feasible to avoid or reduce these adverse impacts. The potential loss of these important cultural and religious sites of the Winnemem Wintu and Pit River Madesi Band would be a cumulatively considerable and disproportionate placement of environmental impacts on Native American populations. This impact is significant and unavoidable, as documented in the DEIS.

Chapter 24, "Environmental Justice," Section 24.3.1, "Methods and Assumptions," describes the methods and assumptions for determining whether there are disproportionately high and adverse effects on minority or low-income populations. Chapter 24, "Environmental Justice," Section 24.3.2, "Criteria for Determining Disproportionately High and Adverse Effects," describes the process and criteria for determining disproportionately high and adverse effects.

CR-6 – United Nations Declaration on "The Rights of Indigenous Peoples"

Several comments reflect concerns that Reclamation is in violation of the United Nations Declaration on "The Rights of Indigenous Peoples." Several comments also suggested that Reclamation consider such international treaties, declarations, and agreements in their decision making process.

In September 2007, the United Nations passed a Declaration on "The Rights of Indigenous Peoples." The United States did not vote in favor of the resolution at that time citing various flaws in the Declaration as it would pertain to the Indigenous Peoples of the United States. However, this position was reviewed by the Obama Administration after consultation with many Native American tribes and other individuals and groups who urged the U.S. to support the Declaration. On January 12, 2011 the Obama Administration announced the U.S. support for the United Nations Declaration on the Rights of Indigenous Peoples. As part

of this Announcement, the Administration detailed initiatives to promote the Government-to-Government Relationship and improve the lives of Indigenous Peoples. In the Announcement it is stated that "The United States aspires to improve relations with indigenous peoples by looking to the principles embodied in the Declaration and its dealings with federally recognized tribes, while also working, as appropriate, with all indigenous individuals and communities in the United States."

The Administration recognized, however, that the Declaration "is not legally binding or a statement of current international law." See also Prophet v. United States, 2011 U.S. dist. LEXIS 115801 (S.D. Oh. 2011); Bey v. Roberts, 2011 U.S. Dist. LEXIS 139460 (N.D. Oh. 2011). Rather than create any new rights or obligations, the Declaration expresses "aspirations that this country seeks to achieve within the structure of the U.S. Constitution, laws, and international obligations, while also seeking, where appropriate, to improve our laws and policies." The Declaration is an important statement of U.S. policy, but neither it nor the Announcement has changed existing law, created new obligations, or resulted in any new procedural or substantive rights. The Declaration must be read as intended to work within the existing legal environment. Reclamation supports the Declaration, as outlined in the Announcement, but it does not alter Reclamation's obligations, in developing the SLWRI, under applicable law and policy. Reclamation has undertaken the SLWRI consistent with the Declaration and this Administration's Announcement of support.

Information on current federal laws relating to Native American relationships and cultural resources is found in Chapter 14, " Cultural Resources," Section 14.2, "Regulatory Framework," of the DEIS.

CR-8 – Native American Connection to Salmon

Several comments raised concerns that salmon are an integral part of the Winnemem Wintu culture and historically have served as an essential food source.

Chapter 14, "Cultural Resources," Section 14.1.1, "Regional Setting," describes the history of salmon resources as an important component of the diet of Native American's, as shown in the archaeological record, in the vicinity of the current Shasta Reservoir, most recently by the Wintu peoples. Shasta Dam, which started filling in 1943, completely blocked the historic salmon runs from the upper Sacramento River system. This was a major change for the 20th century Native American peoples.

Efforts called for as part of the 2008 USFWS BO, and 2009 NMFS BO investigations are underway to explore the feasibility of providing fish passage around Shasta Dam for salmonids. See Master Comment Response FISHPASS-1, "Fish Passage Above Shasta Dam" for a

description of the fish passage pilot program under development by Reclamation. Fish Passage investigations are separate from the SLWRI and not part of any of the alternatives under consideration. If implemented, a separate NEPA document will be prepared.

The SLWRI DEIS Chapter 1, "Introduction," Section 1.2.1, "Project Purpose and Objectives," states one primary project objective as: *Increase the survival of anadromous fish populations in the Sacramento River, primarily upstream from the Red Bluff Pumping Plant (RBPP).* This project objective is met primarily by providing a larger cold water storage pool in Shasta Reservoir for release downstream to support salmonid that spawn in the Upper Sacramento River below Shasta Dam. Native American groups would benefit from these spawning improvements to the same extent as the general public by recreational fishing opportunities which should increase with the implementation of the SLWRI project alternatives. See Chapter 11, "Fisheries and Aquatic Ecosystems," of the DEIS for a complete discussion of the effects of the project alternatives on salmonid resources of the Sacramento River.

CR-11 – Cultural Resources and NEPA

Several comments raised concerns that the cultural resource impact evaluations and mitigation measures in the DEIS do not meet NEPA requirements.

Chapter 14, "Cultural Resources," summarizes cultural resources identification efforts and impact analysis methods, as well as consultation and coordination with Native American tribes and other non-federally recognized groups and individuals, that were all used to evaluate the impacts of each alternative and approaches to mitigate significant impacts. The impact analyses and mitigation measures are comparable to the information available for the alternatives identified for purposes of the SLWRI. Impacts from inundation of Traditional Cultural Properties and Sacred Land Filings ("Impact Culture-2") in Section 14.3.4, "Mitigation Measures" for "CP1," "CP2," "CP3," "CP4," and "CP5," are identified as significant and unavoidable, with no feasible mitigation identified. Should authorization by Congress lead to implementation of one of the Action Alternatives, subsequent processes under NEPA, NHPA Section 106, and other applicable laws would be included in early planning efforts to identify and consider alternatives to avoid, minimize, or mitigate the undertaking's effects on historic properties and cultural resources.

CR-12 – Cultural Resources and CEQA

Several comments raised concerns that the DEIS is inadequate to meet CEQA requirements related to cultural resources.

Chapter 1, "Introduction," of the DEIS states that "This document has also been prepared in accordance with the California Environmental Quality Act (CEQA) and could be used by State of California (State) permitting agencies that would be involved in reviewing and approving the project" (Page 1-1). However, at the time of publishing of the Final EIS, a CEQA Lead Agency has not been identified. The CEQA Guidelines outline the process to determine the appropriate State Lead Agency in Section 15050-15053. In addition, CEQA Section 21067 defines the Lead Agency as the "public agency which has the principal responsibly for carrying out or approving a project which may have a significant effect upon the environment." Reclamation will be carrying out the "project" and at this time, it is not certain if there will be State or local agency approvals or funding involved in implementation.

As discussed in the Master Comment Response CEQA-1, "CEQA Compliance," the DEIS may not be sufficient to serve as a DEIR for CEQA purposes and would require scrutiny by any State CEQA Lead Agency before release to the public as a DEIR. Section 15221 of the CEQA Guidelines states that when a NEPA document is ready before the CEQA document, the State Lead agency shall evaluate the NEPA document for CEQA compliance and augment the CEQA document with CEQA specific analysis if necessary. The State Lead Agency would evaluate the legal sufficiency of all aspects of the document including range of alternatives, impact assessments, mitigation measures, and effects to State protected resources including state-listed endangered and threatened species and cultural resources.

Chapter 14, "Cultural Resources," Section 2.2, "Regulatory Framework," "State" briefly describes how CEQA considers potential effects to cultural resources. In addition to CEQA, this section identifies other State laws regarding protection of Native American burials, skeletal remains, and associated grave goods regardless of their antiquity, and provides for the sensitive treatment and disposition of those remains (California Health and Safety Code Section 7050.5, California Public Resources Code Sections 5097.94 et seq.).

Any CEQA process related to the SLWRI would require a Notice of Preparation and scoping process, consultation with State and local Responsible Agencies and public circulation of a DEIR in accordance with CEQA. Reclamation, as a federal agency, has no standing under California law to be the State CEQA Lead Agency. Reclamation will not make a judgment on the legal adequacy of the DEIS for CEQA compliance. Reclamation will not speculate on whether a State Lead Agency under CEQA will be required for the SLWRI, or what State or local agency might become the State Lead Agency.

Changes have been made to the text in the Final EIS to reflect that the document is not being published as a fully CEQA-compliant document.

CR-13 – Native American Graves Protection and Repatriation Act Process

Several comments reflected concerns regarding the effects to burial sites and related requirements under the Native American Graves Protection and Repatriation Act (NAGPRA).

Chapter 14, "Cultural Resources," Section 14.2.1, "Regulatory Framework," describes the Native American Graves Protection and Repatriation Act (Public Law 101-601; 25 United States Code 3001-3013) that pertains to Native American burial sites and regulates the removal of Native American human remains, funerary objects, sacred objects, and items of cultural patrimony on Federal and tribal lands. The Act requires permits for intentional removal or excavation of Native American human remains on Federal lands, covers cases of inadvertent discoveries, and dictates the ultimate disposition process of Native American human remains and cultural items.

NAGPRA is one of several federal laws that Reclamation will comply with if Congressional authorization is received. Specific NAGPRA compliance may be coordinated with the NHPA Section 106 process. Reclamation complies with NAGPRA concerning the cultural affiliation and disposition of any Native American human remains and cultural items from Federal lands.

CR-15 – National Historic Preservation Act Section 106 Consultations

Additionally, commenters believe there has been inadequate consultation with the Winnemem Wintu through the NHPA Section 106 process.

Reclamation formally initiated NHPA Section 106 consultation in 2007 with Federally-recognized Indian tribes (Grindstone Indian Rancheria of Wintun-Wailaki Indians, Paskenta Band of Nomlaki Indians, Pit River Tribe, and Redding Rancheria) and with other Native American groups (Shasta Nation, Winnemem Wintu, and Wintu Tribe/Toyon-Wintu Center). From August 2007 to March 2008, nine meetings were held with Native American groups whose traditional territories overlap with the SLWRI study area. The purpose of the meetings was to identify cultural resources, including places of traditional and ceremonial use, and other areas of concern related to the SLWRI to the Native American community. These meetings also provided these groups opportunities to comment or raise concerns regarding potential effects on these resources from the undertakings under study for the SLWRI. Five groups participated in these meetings, including the Grindstone Indian

Rancheria (one meeting), Paskenta Band of Nomlaki Indians (one meeting), Pit River Tribe (three meetings), Shasta Nation (one meeting), and Winnemem Wintu (three meetings). Resources of cultural and religious significance discussed at these meetings and identified through ethnographic, ethnohistoric, and archaeological research and other comments from Native American tribes, groups, and individuals were incorporated into the DEIS, Chapter 14, "Cultural Resources," with impact analyses also based on information, comments, and concerns received from these sources. Due to the programmatic nature of this EIS in support of a feasibility report, NHPA Section 106 consultations were used only to identify resources of concern for the SLWRI and not completed, pursuant to 36 CFR 800.1(c) *Timing*, regarding nondestructive project planning activities. If a project to raise Shasta Dam is authorized by Congress, the NHPA Section 106 process would resume early in that planning process providing subsequent consideration and consultations regarding alternatives to avoid, minimize or mitigate that undertaking's adverse effects on historic properties, according to the requirements of 36 CFR Part 800.

Additional opportunities, other than through the NHPA Section 106 process, to comment on cultural resources were also provided through the NEPA process. Chapter 27, "Public Involvement, Consultation, and Coordination," summarizes public outreach involvement efforts related to development of the SLWRI, guided by the *Strategic Agency and Public Involvement Plan* (Reclamation 2003a). These efforts provided the public, stakeholders, Federally recognized tribes, Native American groups and individuals, and public agencies multiple opportunities to review SLWRI documents and to provide comments throughout the SLWRI NEPA process. Documents were distributed in multiple formats and comments were accepted through a variety of venues throughout the NEPA process. Chapter 27, "Public Involvement, Consultation, and Coordination," Section 27.4.2, "Consultation and Coordination with Tribal Governments," and Section 27.4.3, "Coordination with Native American Groups," summarize efforts to specifically involve Federally-recognized and non-federally recognized Native Americans in the NEPA process. Comments received through the EIS review process will be incorporated into the Final EIS and will be available to the decision-maker. Chapter 1, "Introduction," Section 1.6, "Areas of Controversy," of the DEIS acknowledges that Native American concerns and cultural resources remain an area of controversy. Public interests will be included in the decision to select an alternative and in a recommendation to Congress for authorization.

33.3.14 Master Comment Responses for Flood Management

FM-6 – Effects to Downstream Flooding

Several comments raised concerns related to flood management, particularly downstream from Shasta Dam along the Sacramento River. Some comments questioned how an enlargement of Shasta Dam would reduce flood damages downstream on the Sacramento River. Other comments reflect concern over revised reservoir operations, construction activities, and related downstream effects on physical processes, including erosion and sedimentation.

As stated in Chapter 1, "Introduction," Section 1.2.1, "Project Purpose and Objectives," of the Final EIS, reducing flood damage along the Sacramento River is a secondary objective of the project. Reclamation did not formulate alternatives specifically to address secondary objectives, but secondary objectives were considered to the extent possible through pursuit of the primary project objectives. Flood management is thoroughly discussed in Chapter 6, "Hydrology, Hydraulics, and Water Management," of the DEIS and in the Draft Plan Formulation Appendix of the DEIS.

As stated in Chapter 6, "Hydrology, Hydraulics, and Water Management," Section 6.3.2, "Criteria for Determining Significance of Effects," of the DEIS, to prevent an increase in flood damages in the study area, the SLWRI must not cause a significant increase in the frequency or magnitude of flood flows on the Sacramento River. The current regulation of Shasta Dam for flood control requires that releases be restricted to quantities that will not cause downstream flows or stages to exceed, insofar as possible, (1) a flow of 79,000 cubic feet per second (cfs) at the tailwater of Keswick Dam, and (2) a stage of 39.2 feet at the Sacramento River Bend Bridge gaging station near Red Bluff (corresponding roughly to a flow of 100,000 cfs). Because of the uncontrolled nature of the inflows between Keswick Dam and Bend Bridge, the 100,000 cfs flow objective at Bend Bridge is the critical objective for minimizing flood damage. It is also important to ensure that the project does not increase potential flood damages by locating any new facilities within the 100-year floodplain or in a location that could impede or redirect flood flows, thereby potentially increasing damage to other property.

As captured in the Executive Summary of the DEIS, all action alternatives increase reservoir capacity for capture of high flood flows, so all action alternatives contribute to reducing flood damage along the Sacramento River (a SLWRI secondary objective). CP4 and CP5 also include augmenting spawning gravel and restoring riparian, floodplain, and side channel habitat in the upper Sacramento River, thereby

contributing to conserving, restoring, and enhancing ecosystem resources.

As described in Chapter 6, “Hydrology, Hydraulics, and Water Management,” Sections 6.3.3, “Direct and Indirect Effects,” and 6.3.4, “Mitigation Measures,” of the DEIS, no flood management mitigation measures are proposed for the action alternatives because no adverse flood management impacts have been identified (Impact H&H-2 “place housing or other structures within a 100-year flood hazard area,” and Impact H&H-3 “place within a 100-year flood hazard area structures that would impede or redirect flood flows”). Impact H&H-1 (“change in frequency of flows above 100,000 cfs on the Sacramento River Below Bend Bridge”) could result in beneficial impacts, so no mitigation is needed.

Additional information is available in the Physical Resources Appendix, Draft Hydrology, Hydraulics, and Water Management Technical Report of the DEIS.

As described in DEIS Chapter 2, “Alternatives,” Section 2.3.2, “Environmental Commitments Common to All Action Alternatives,” Reclamation and/or its contractors would incorporate certain environmental commitments and best management practices (BMP) into any plan identified for implementation to avoid or minimize potential impacts. Reclamation would also coordinate planning, engineering, design and construction, operation, and maintenance phases of any authorized project modifications with applicable resource agencies.

Developing and implementing an Erosion and Sediment Control Plan is one of those commitments. Reclamation would prepare and implement an erosion and sediment control plan to control short-term and long-term erosion and sedimentation effects, and to stabilize soils and vegetation in areas affected by construction activities. The plan would include all of the necessary local jurisdiction requirements regarding erosion control, and would implement BMPs for erosion and sediment control, as required. Types of BMPs may include, but would not be limited to, earth dikes and drainage swales, stream bank stabilization, and use of silt fencing, sediment basins, fiber rolls, and sandbag barriers.

DEIS Chapter 4, “Geology, Geomorphology, Minerals, and Soils,” describes the affected environment and Federal, State, and regional and local regulatory framework for geological resources including geology, seismicity, soils erosion, mineral resources, and geomorphology for the dam and reservoir modifications proposed under SLWRI action alternatives. It also describes the project-level impacts of the No-Action Alternative and action alternatives on geological resources, mitigation measures for those impacts, and cumulative effects of all of the

alternatives. As described in Sections 4.3.4 "Direct and Indirect Effects" and 4.3.5 "Mitigation Measures" of the DEIS, in the Upper Sacramento River portion of the primary study area, no mitigation measures are proposed for Impact Geo-11 ("alteration of fluvial geomorphology") because there are no impacts from CP1-3 and impacts from CP4 and 5 are less than significant, and Impact Geo-12 ("alteration of downstream tributary fluvial geomorphology due to Shasta Dam operations") because impacts from the action alternatives are less than significant. A mitigation measure is proposed for Impact Geo-9 ("substantial increase in channel erosion and meander migration") because although impacts from the action alternatives are less than significant, the mitigation measure ("implement channel sensitive water release schedules") will further reduce the impact. In the Lower Sacramento River and Delta, no mitigation measure is proposed for Impact Geo-13 ("substantial increase in channel erosion and meander migration") because impacts from the action alternatives are less than significant.

The analyses presented in the DEIS meets the requirements of NEPA, and no modifications are proposed in response to these comments.

33.3.15 Master Comment Responses for Fracking

FRACK-1 – Water Supply Used for Fracking

Several comments raised the topic of fracking. Some commenters expressed that fracking would not be a valid use of additional water supplies to be developed by the project.

Fracking is not a purpose of the project, but is not excluded from potential uses of water to be developed by the project. The purpose of the project is stated in Chapter 1, "Introduction," of the Final EIS. While increasing water supply reliability is a primary objective of the SLWRI, as stated in Chapter 1, "Introduction," of the Final EIS, Reclamation does not regulate the specific uses of CVP or SWP water supply. SLWRI alternatives would not increase existing maximum CVP or SWP contract quantities or expand the place of use, but would allow Reclamation to increase water supply reliability of existing CVP and SWP contracts.

Currently, fracking represents a minor use of water in California. The State Department of Conservation estimates that statewide, about 270 acre-feet of water per year is used for hydraulic fracture stimulation activities (BDCP 2013). By comparison, the SLWRI alternatives would increase dry and critical year water supplies for CVP/SWP deliveries between 31,000 acre-feet and 75,900 acre-feet. The SLWRI alternatives would not change the relative allocation among different authorized users, thus approximately 28,000 acre-feet to 88,300 acre-feet would be for south-of-Delta agricultural and M&I deliveries (as described in

Chapter 6, "Hydrology, Hydraulics, and Water Management," of the DEIS). A full assessment of the potential impacts of the alternatives on water resources is provided in Chapters 6, "Hydrology, Hydraulics, and Water Management," and Chapter 7, "Water Quality," of the DEIS.

33.3.16 Master Comment Responses for Road and Bridge Relocations

RBR-1 – Access Across Shasta Dam

Several comments were received concerning access to the west side of Shasta Dam during the period of construction. The area consists of several residences, businesses, and several recreation facilities. The comments expressed concern over the possible economic impacts as a result of the lack of access or the possibility of an inconvenient detour.

As stated in the DEIS Chapter 18, "Recreation and Public Access," Section 18.3.4, "Direct and Indirect Effects," construction activity necessary to raise Shasta Dam and complete related facilities would prevent visitors from crossing the dam. The DEIS also states that the impact of the road closure would be potentially significant. Mitigation for this impact is described in the DEIS and Final EIS in Chapter 18, "Recreation and Public Access," Section 18.3.5, "Mitigation Measures," under the heading "Mitigation Measure Rec-2" for each action alternative. As described, to mitigate the impacts of the road closure, Reclamation would provide an alternate route. This route would use existing river crossings either immediately downstream from Shasta Dam or further south to provide access to the Chappie-Shasta Off-Highway Vehicle (OHV) Area, residences, and businesses on the west side of Shasta Dam. The route would be improved to provide adequate access, security features, and road improvements, as necessary, and made sufficient so that vehicles can safely use the route. Mitigation Measure Rec-2 has been revised to provide further clarification. Mitigation Measure Rec-2 now states:

> *Reclamation will inform recreation users of the Chappie-Shasta OHV Area about an alternative access route. This route will use existing river crossings either immediately downstream from Shasta Dam or further south. The route will be improved to provide adequate access, security features, and road improvements (e.g., by grading unpaved portions), as necessary, and made sufficient so that vehicles can safely use the route. To mitigate the temporary disruption in public tours of Shasta Dam during construction, Reclamation will develop and provide enhanced information about the dam and its operation at the Reclamation Visitor Center at the dam, which would remain open. Mitigation for temporary loss of access to the trailhead at the west end*

of Shasta Dam is not necessary because the trailhead itself would be affected by construction.

With implementation of Mitigation Measure Rec-2, this impact would be considered less than significant for all action alternatives.

As discussed in Chapter 2, "Alternatives," Section 2.3.2, "Environmental Commitments Common to All Action Alternatives," environmental commitments for the proposed action include developing and implementing a construction management plan to avoid or minimize potential impacts on public health and safety during project construction, to the extent feasible. Environmental commitments implemented before construction would also include developing and implementing a comprehensive mitigation strategy to minimize potential impacts to physical, biological, and socioeconomic resources described in this DEIS. As described in Reclamation's NEPA Handbook, Reclamation is obligated to fulfill and appropriately fund all monitoring and mitigation measures that it commits to implementing in its final decision. For NEPA documents, these commitments generally appear in the ROD and other decision documents.

RBR-2 – Reduced Public Access Around Shasta Lake

Several comments received during the public comment period expressed concern over bridges and roads that would be inundated by the new high water level of the proposed alternatives, and how these bridges and roads would be relocated. Commenters also raised concerns over continued and maintained access to Shasta Lake, both during and after construction, and how this would be accomplished. It was also requested that the impacts caused by the road and bridge relocations be addressed in the Final EIS.

All action alternatives include road relocations and bridge modifications to maintain existing levels of access around Shasta Lake. In summary, all action alternatives include five vehicular bridge replacements/ modifications, three railroad bridge modifications, and up to 30 road segment relocations.

As described in the DEIS Engineering Summary Appendix, Chapter 4, "Design Consideration for Reservoir Area Infrastructure Modifications and/or Relocations," as a result of raising Shasta Dam, Charlie Creek, Doney Creek, McCloud River, and Didallas Creek vehicle bridges would need to be replaced with a minimum of four-feet of freeboard above the full pool elevation. Additionally, Fender's Ferry vehicle bridge would require modifications to keep the steel superstructure from inundation. More information regarding vehicle bridge modification and replacement design assumptions and construction activities and quantities can be found in the DEIS Engineering Summary Appendix,

Chapter 4, "Design Consideration for Reservoir Area Infrastructure Modifications and/or Relocations," under the "Bridge Relocations" heading and in Plates 27 through 31.

As stated in the DEIS Engineering Summary Appendix, Chapter 4, "Design Consideration for Reservoir Area Infrastructure Modifications and/or Relocations," as a result of raising Shasta Dam, Union Pacific Railroad bridges at the existing Sacramento River 2nd Crossing and Doney Creek, would need to be modified to accommodate the higher water level. The DEIS also states, that modifications would be required for Pit River Bridge. The Pit River Bridge would remain in place, but a watertight concrete tub would be placed around the existing bearing and lower steel truss to keep the structure dry. More information regarding the construction activities, construction quantities, and details related to railroad bridge relocations and modifications can be found in the DEIS Engineering Summary Appendix Chapter 4, "Design Consideration for Reservoir Area Infrastructure Modifications and/or Relocations," under the "Union Pacific Railroad Bridge Replacements" heading and in Plates 32 through 38.

As stated in DEIS Chapter 20, "Transportation and Traffic," Section 20.3.4, "Direct and Indirect Effects," under Impact Trans-2, access to Shasta Lake during construction would be affected by the proposed bridge and road relocations, and traffic slowdowns may also occur because of actions such as lane closures and heavy equipment accessing relocation areas. It is anticipated that the new roadway and bridge alignments would be constructed and connected to connecting facilities before demolition of existing facilities in the proposed inundation area. The DEIS Chapter 20, "Transportation and Traffic," Section 20.3.5, "Mitigation Measures," has additional information on how lane closures and traffic slowdowns during construction would be mitigated by Reclamation during construction. An example mitigation measure is below:

> *Mitigation Measure Trans-1 – Before construction starts, Reclamation and its primary contractors for engineering and construction will develop a coordinated construction traffic control plan to minimize the simultaneous use of roadways by different construction contractors for worker commute trips, material hauling, and equipment delivery to the extent feasible. The plan will outline phasing of activities and the use of multiple routes to and from off-site locations to minimize the daily amount of traffic on individual roadways. Reclamation will require that the construction contractors implement and enforce the plans throughout the construction periods.*

Road and bridge relocations would allow for continued access to recreation facilities, private residences and businesses around Shasta Lake after construction is completed.

As stated in the DEIS Engineering Summary Appendix, Chapter 4, "Design Considerations for Reservoir Area Infrastructure Modifications and/or Relocations," under the "Road Relocations" heading, approximately 4.1 miles of paved roadway and 2.3 miles of unpaved roadway would require relocation as a result of the 18.5-foot raise. Feasibility-level quantities based on the feasibility-level designs have been estimated for each affected road segment.

The process of developing the cost estimates for both bridge and road relocations is described in the DEIS Engineering Summary Appendix, Chapter 5, "Opinion of Probable Construction Cost." Unit prices were developed using a semi-detailed method and applied to the quantities developed from the feasibility-level designs. Contingencies for all cost estimates are included as described in the above mentioned section in the DEIS. The DEIS Chapter 20, "Transportation and Traffic," Section 20.3.4, "Direct and Indirect Effects," describes the potential effects of road relocations for each SLWRI action alternative. These impacts are described for each alternative and mitigation for each impact is provided in DEIS Chapter 20, "Transportation and Traffic," Section 20.3.5, "Mitigation Measures."

Reclamation is aware that road and bridge relocations and improvements will be required with any of the proposed alternatives. The affected roads and bridges are detailed in the DEIS Engineering Summary Appendix, Chapter 4, "Design Considerations for Reservoir Area Infrastructure Modifications and/or Relocations." As described, affected roads and bridges would be replaced or modified as necessary to maintain existing levels of access around the shoreline. If the SLWRI is authorized by Congress, further refinement of road relocations and bridge modification designs will be completed.

33.3.17 Master Comment Responses for Water Rights

WR-1 – Water Rights

DEIS Chapter 6, "Hydrology, Hydraulics and Water Management," Sections 6.2, "Regulatory Framework," and Section 3.2, "Criteria Determining Significance," and Chapter 7, "Water Quality," Section 7.2.2, "State," regulatory framework of the DEIS describes the relevant State Water Resources Control Board (State Water Board) water rights orders and decisions, water quality control plans, and information on the Joint Point of Diversion temporary petitions and water transfer petitions currently under consideration at the State Water Board. These orders, decisions, plans and petitions will continue to be enforced under both the

No Action Alternative and with any of the action alternatives. The SLWRI does not alter any of these proceedings and they are acknowledged in the DEIS.

Chapter 6, "Hydrology, Hydraulics and Water Management," Section 6.3.3, "Direct and Indirect Effects," provides information on current Shasta Reservoir storage levels and anticipated average end-of-month storage for the No Action and each of the action alternatives under both the 2005 conditions and 2030 future conditions.

The existing rights to store water in Shasta Lake, along with historical storage data, were evaluated to determine if additional storage rights were required to fully use the increase in storage provided by the proposed project. Reclamation holds three permits for storage at Shasta – Permit 12721 allows of storage of up to 3,190,000 acre-feet per annum between October 1 and June 30; Permits 12722 and 12723 are for the storage of 1,303,000 acre-feet per annum between October 1 and June 30.[1] Total combined storage under these permits is 4,493,000 acre-feet per annum.

The maximum amount of water that can be stored under these rights is further limited by the actual amount stored under that right. All water right permits have a period during which the actual maximum beneficial use (or storage) under the right is determined – after this period expires, the permit holder receives a license for the highest amount put to beneficial use (or stored) in any one year. The development period for Permits 12721, 12722 and 12723 ended on December 1, 1990.

Shasta Lake storage data from 1944 through 2013 was reviewed to determine if the present storage rights are adequate to support an expansion of Shasta Lake. Maximum storage under the Shasta permits occurred in the October 1977 to June 1978 storage season, when 3,190,000 acre-feet was stored under Permit 12721 and 716,336 acre-feet was stored under Permits 12722 and 12723 for a total of 3,906,336 acre-feet.[2] The next highest season to date was 1992/1993, when 2,869,335 acre-feet was stored under Permit 12721. The difference between the highest season of storage and second highest season of storage is 1,037,001 acre-feet.

The year of maximum storage started with only 631,700 acre-feet in storage on October 1, 1977.[3] Above normal precipitation resulted in

[1] The purpose of use for Permit 12722 is municipal and industrial; the purpose of use for Permit 12723 is irrigation and other miscellaneous uses. These permits cover the same amount of water; that is, a total 1,303,000 acre-feet per annum can be stored for all purposes covered by these permits.
[2] 1978 is the only year in which storage occurred under Permits 12722 and 12723.
[3] Storage is calculated using a "Water Year", which runs from October 1 to September 30 of the next year.

Shasta storage peaking at 4,447,111 acre-feet on May 31, 1978.[4] This extremely dry year followed by an extremely wet year, with no environmental bypass or release requirements, has occurred only once since storage began at Shasta in 1944. This combination of events (extremely low storage followed by above normal precipitation) is highly unlikely to be repeated – primarily because Biological Opinions for the protection of salmonids in the Sacramento River mandate higher storage levels of approximately 2,000,00 acre-feet in Shasta Lake at the end of the water year. Assuming that Shasta storage is increased by 634,000 acre-feet to 5,134,000 acre-feet, end of year storage will have to be less than 641,000 acre-feet (or 32 percent of the minimum storage target set by the Biological Opinions) in order for the present permitted Shasta storage rights of 4,493,000 acre-feet to be exceeded. End of year storage would have to be less than 1,227,664 acre-feet (or 61 percent of the minimum storage target) in order for the year of highest storage (3,906,336 acre-feet) to be surpassed.

This evaluation shows that the present rights for storage of water in Shasta Lake under Permits 12721, 12722 and 12723 are sufficient to fully use the maximum increase in storage provided by the proposed project. Therefore, there is no need for Reclamation to apply for additional storage rights at Shasta Lake as part of the SLWRI.[5]

Chapter 26, "Other Required Disclosures," Section 26.6.2, "State Requirements," states that none of the action alternatives include any actions that would require acquisition, use or modification of water rights. The action alternatives would comply with all existing water rights in the primary and extended study areas.

33.3.18 Master Comment Responses for Comprehensive Mitigation

CMS-1 – EIS Mitigation Plan

As required by the National Environmental Policy Act (NEPA), Chapter 2, "Alternatives," of the DEIS included a discussion of mitigation measures and environmental commitments that are intended to reduce the environmental consequences of the action alternatives. Several commenters expressed concern that there was insufficient breadth in the mitigation measures or that strategies for implementation were incomplete.

[4] Storage is calculated on a daily basis and incorporates both initial storage volumes and refill storage volumes, which is why the total volume stored can be (and is in this case) higher than the volume represented by the end of season minus the beginning of the season.

[5] If required, an application for an additional or amended water right for an enlarged Shasta Reservoir would be subject to a future action by a State agency. It would be necessary for the State agency to evaluate participation in that action consistent with California Public Resources Code § 5093.542(c).

Mitigation measures must be part of an EIS, but a "fully developed" mitigation plan is not required at this stage of the project. NEPA requires that "mitigation be discussed in sufficient detail to ensure that environmental consequences have been fairly evaluated." (See *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 352, 109 S.Ct. 1835, 1846-47, 104 L.Ed.2d351 (1989)). NEPA does not include "a substantive requirement that a complete mitigation plan be actually formulated and adopted," nor does it "demand the presence of a fully developed plan that will mitigate all environmental harm before an agency can act." Neither does NEPA require that all mitigation measures identified in the mitigation plan be implemented. Mitigation measures become mandatory under NEPA regulations when they are included as a part of the decision to implement a project (40 CFR 1505.3).

The Preliminary Environmental Commitments and Mitigation Plan Appendix of the Final EIS provides a comprehensive summary of the commitments Reclamation has made to be responsive and, in many instances, to reduce impacts; however, final project authorization will determine which mitigation measures will be implemented. On-the-ground projects will be developed in response to the elements of the mitigation plan included in any Congressional authorization. If one of the action alternatives is selected, a monitoring and enforcement program shall be adopted for any mitigation measures that are ultimately included in a decision or, if appropriate, in any recommendation to Congress (40 CFR 1505.2). Regulations for NEPA (40 CFR 1508.28) will allow a subsequent phase of a project, such as environmental mitigation, to "tier" to this EIS to ensure that implementation is consistent with project objectives as planned.

Several commenters referred to requirements for mitigation under the CEQA. At this time, a lead agency for the CEQA has not been identified and discretionary decisions by California public agencies under CEQA are not anticipated without authorization from the state legislature. Should decisions that are subject to CEQA by California public agencies be necessary, it is intended that this EIS could be used by the lead agency, with appropriate scoping and review, for an EIR for those decisions. The definition of "mitigation" under CEQA regulations (CEQA Guidelines 15370) is the same as that used in the federal NEPA regulations (40 CFR 1508.20), although CEQA does require a commitment to mitigation measures within the CEQA document. The Final EIS includes a new appendix to the EIS titled "Preliminary Environmental Commitments and Mitigation Plan Appendix," which may be used by any CEQA lead agency to adopt mitigation measures. Reclamation, however, is not subject to CEQA and will not be making any CEQA decision. Public agencies of the State of California could use this information, supplement it as necessary, decide whether any impact is significant for CEQA purposes, and require appropriate mitigation, as

necessary. Note that decisions required by CEQA would apply only to state and local actions.

In section 2.3.2, "Environmental Commitments Common to All Action Alternatives," the DEIS states that before the publication of the Final EIS, Reclamation would develop a comprehensive mitigation strategy (CMS) intended to minimize or compensate for potential impacts to physical, biological, and socioeconomic resources. The CMS is detailed in a new appendix titled "Preliminary Environmental Commitments and Mitigation Plan Appendix." In addition to summarizing the environmental commitments described in Chapter 2, "Alternatives," the appendix provides a detailed discussion of development, implementation, and monitoring elements for mitigation presented in Chapters 4 through 25 of the EIS.

The systematic approach used to develop, enhance, and/or revise mitigation measures included a comprehensive review of project impacts and applicable mitigation measures by Reclamation and several federal responsible and cooperating agencies (USFWS, Forest Service, U.S. Department of the Interior, Bureau of Land Management (BLM), EPA, and USACE). This process enabled Reclamation to review information in the existing record and either confirm or adjust the need for mitigation specific to each impact. It also provided Reclamation and the responsible and cooperating agencies the opportunity to review the adequacy and feasibility of each mitigation measure identified in the DEIS.

The process included a series of interagency workshops that focused on impacts to physical processes and biological resources. In the workshops, specialists from Reclamation and the cooperating/responsible agencies developed a framework for quantifying some of the impacts in Chapter 11, "Fisheries and Aquatic Ecosystems," Chapter 12, "Botanical Resources and Wetlands," and Chapter 13, "Wildlife Resources," of the EIS and establishing mitigation ratios. A key element of the framework was to consider impacts on specific habitat types and species (e.g., gray pine and associated species) and develop mitigation specific to those habitat types and species. In other words, rather than simply identifying the cumulative number of acres for all habitat types that would be affected by raising Shasta Dam and developing broad mitigation measures for those acres, the mitigation measures would respond to the ecologic diversity of the project area and would be specific to impacts on specific habitat types and species.

In a number of instances, Reclamation identified the need to enhance or revise the mitigation measures in the DEIS. Considerable effort went into determining the amount of mitigation activity that would likely be needed for each impact. For example, the amount of low-gradient stream

reaches in the project area was determined for each of the action alternatives (Impact Aqua-07), and mitigation measures were developed to restore comparable amounts of currently degraded low-gradient streams adjacent to and potentially upstream from Shasta Lake. In another example, potentially adverse impacts to known sites of BLM and Forest Service sensitive plant species were identified (Impact Bot-3). A corresponding mitigation measure was then developed to create a propagation program (including genome sequencing), reestablish plant populations at appropriate locations, and purchase or otherwise secure replacement habitat with conservation easements or other agreements. Other examples are identified in the referenced appendix.

This systematic review:

1. Confirmed that some impacts had no feasible mitigation

2. Identified mitigation measures presented in the DEIS that were deemed adequate by Reclamation and the participating responsible and cooperating agencies;

3. Refined the expected magnitude of an impact, resulting in a revision to the EIS;

4. Clarified mitigation measures with respect to level of specificity (e.g., timing, location, magnitude); and

5. Identified new mitigation measures primarily associated with impacts on biological resources and physical processes and evaluated their feasibility and potential effectiveness.

In addition to the comprehensive discussion of the environmental commitments made by Reclamation in Chapter 2, “Alternatives,” the mitigation measures described in the “Preliminary Environmental Commitments and Mitigation Plan Appendix,” are incorporated into the relevant sections of Chapters 4 through 25 of the EIS.

At this point in Reclamation’s NEPA process, some mitigation measures are more certain than others. Mitigation measures have been sufficiently developed that Reclamation can identify the general amount, type, and location of mitigation actions that will be implemented if and when Congress authorizes an action.

33.3.19 Master Comment Responses for McCloud River Public Resource Code/Fed W&S Eligibility

WASR-1 – Eligibility of the McCloud River as a Federal Wild and Scenic River

Several commenters stated that raising Shasta Dam would conflict with the designation of the McCloud River as a Federal wild and scenic river. This issue is addressed in Chapter 25, "Wild and Scenic River Considerations for the McCloud River."

The McCloud River has not been designated by Congress as a Federal wild and scenic river. Portions of the McCloud River, however, have been evaluated by the USFS and determined eligible for inclusion into the national Wild and Scenic River system.

To afford the river any Federal protection under the Wild and Scenic Rivers Act, it would need to be a designated study river or a designated component of the national system. At this time, the McCloud River has neither been designated a component of the national system nor a study river.

The Wild and Scenic Rivers Act does not prohibit water developments that may affect portions of rivers that are eligible for inclusion in the national system. Section 5(d)(1) of the act does, however, require that in all planning for the use and development of water and related land resources, consideration be given to potential national wild, scenic, and recreational river areas by all Federal agencies involved.

The EIS fully considers and discloses the effects of raising Shasta Dam on the eligibility of the McCloud River for inclusion into the Federal system. Raising Shasta Dam would affect the eligibility of between 1,470 linear feet (CP1) and 3,550 linear feet (CP3, CP4, CP4A, and CP5) of the lower McCloud River because water in those reaches would no longer be "free flowing," a criteria for designation as a Federal Wild and Scenic River. Water quality, another criterion for designation, would also be affected by periodic inundation. The DEIS also discloses the impacts to the river's outstandingly remarkable values (ORV). These impacts include the potential inundation of prehistoric and historic sites from past use by Indian tribes, late 1800 and early 1900 resorts, and logging activities; the potential loss of habitat for "blue ribbon trout species" (USFS 1994); and impacts to geologic features including rock outcrops, cascades, and pools.

The maximum impact on the river's free-flowing condition would be less than 3 percent of the total length of the lower river that is eligible for designation (DEIS Chapter 25, "Wild and Scenic River

Considerations for McCloud River"). This impact was determined to be significant; no feasible mitigation was identified.

WASR-3 – The Shasta-Trinity National Forest LRMP and Protection of the Eligibility of the McCloud River as a Wild and Scenic River

Some commenters suggested that the raising of Shasta Dam and inundation of part of the McCloud River conflicts with the Shasta-Trinity National Forest (STNF) Land and Resource Management Plan (LRMP). The STNF LRMP details actions of the Forest Service that occur on STNF lands. Raising Shasta Dam is not a Forest Service project; rather, it is a Reclamation proposal for which the Forest Service is a cooperating Federal agency. The STNF LRMP does not extend to private land that is not under the administration of the Forest Service. The portion of the McCloud River that would be affected by raising Shasta Dam is currently private land and not subject to Forest Service administration under the STNF LRMP.

The Federal Wild and Scenic Rivers Act does not prohibit water developments that may affect portions of rivers that are eligible for inclusion in the national system. Section 5(d)(1) of the Act requires that in all planning for the use and development of water and related land resources, consideration be given to potential national wild, scenic, and recreational river areas by all Federal agencies involved.

The EIS fully considers and discloses the effects of raising Shasta Dam on the eligibility of the McCloud River for inclusion into the national system. Raising Shasta Dam would affect the eligibility of between 1,470 linear feet (CP1) and 3,550 linear feet (CP3, CP 4, CP 4A, and CP5) of the lower McCloud River because water in those reaches would no longer be "free flowing," a criterion for designation as a Federal wild and scenic river. Water quality, another criterion for designation, would also be affected by periodic inundation. The EIS also discloses the impacts to the rivers ORVs. These impacts include the potential inundation of prehistoric and historic sites from past use by Indian tribes, late 1800 and early 1900 resorts, and logging activities; the potential loss of habitat for "blue ribbon trout species" (USFS 1994); and impacts to geologic features, including rock outcrops, cascades, and pools.

The maximum impact on the river's free-flowing condition would be less than 3 percent of the total length of the lower river that is eligible for designation (DEIS Chapter 25, "Wild and Scenic River Considerations for McCloud River," Section 25.4.3, "Direct and Indirect Effects").

WASR-4 – CRMP's Responsibilities to Maintain the Outstandingly Remarkable Values of the McCloud River

Some commenters suggested that the Coordinated Resource Management Plan (CRMP) obligates the USFS to seek designation of the McCloud River under the Federal Wild and Scenic Rivers Act. The role of the CRMP is addressed in EIS Chapter 25, "Wild and Scenic River Considerations for the McCloud River," Section 25.1, "Background," which has been revised in response to comments on the DEIS. The CRMP was established to coordinate actions among the signatory landowners and parties with vested interests in the McCloud River so that actions of the signatory landowners on their properties would protect the ORVs of the McCloud River. The CRMP's purpose is to protect the ORVs through coordination of actions by signatory members on their properties. The CRMP does not pertain to the protection of ORVs by nonsignatories or on any land other than that of the signatory landowners. Under the terms of the CRMP, the Forest Service reserves the right to seek Wild and Scenic River designation if, for any reason, the actions of a signatory member of the CRMP on the signatory member's land failed to protect the ORVs, as described in the CRMP Memorandum of Understanding.

Reclamation is not a signatory to the CRMP. Raising Shasta Dam is a Federal proposal for which Reclamation is the lead agency. Raising Shasta Dam is not an action arising out of the CRMP or from actions by a member of the CRMP. As such, the CRMP does not obligate the Forest Service to seek designation of the McCloud River as part of the national system as a result of Reclamation's proposal to raise Shasta Dam. Text has been added to Chapter 25, "Wild and Scenic River Considerations for the McCloud River," to clarify that the responsibilities of the CRMP are limited to the properties of the signatory landowners.

WASR-6 – Protections of the Lower McCloud River as Identified in the California Public Resources Code, Section 5093.542

Several commenters stated that raising Shasta Dam would conflict with California Public Resources Code Section 5093.542, an amendment to the California Wild and Scenic Rivers Act (California Public Resources Code Section 5093.50 to Section 5093.54), that affords protection to the wild trout fishery and free-flowing condition of the McCloud River. This issue is addressed in Chapter 25, "Wild and Scenic River Considerations for the McCloud River."

The California Resources Agency assessed the suitability of the McCloud River for inclusion in the California Wild and Scenic Rivers System, and it was found eligible. However, the California legislature declined to add the river to the California Wild and Scenic Rivers System and instead amended the California Wild and Scenic Rivers Act,

California Public Resources Code Section 5093.542, to protect the river's wild trout fishery and free-flowing condition from McCloud Dam to Shasta Reservoir.

The Final EIS has been revised to clarify that the action alternatives would affect the wild trout fishery and free-flowing condition of the lower McCloud River, as defined in the California Public Resources Code Section 5093.542. In the Final EIS, Impacts WASR-3 and WASR-4 in Chapter 25, "Wild and Scenic River Considerations for the McCloud River," and analysis were refined to describe how action alternatives would affect the wild trout fishery and free-flowing condition of the lower McCloud River, as identified in the California Public Resources Code Section 5093.542.

The Final EIS has also been revised to enhance the level of detail and commitment to mitigate impacts described under WASR-3 and WASR-4. These include efforts to improve, protect, and restore the wild trout fishery of the lower McCloud River and, to a lesser degree, mitigate impacts on free-flowing conditions. Specifically, Mitigation Measure WASR-3 "Develop and Implement a Comprehensive Multi-scale Fishery Protection, Restoration and Improvement Program for the Lower McCloud River Watershed" has been refined to include acquisition of lands from willing sellers on the lower McCloud River. Additionally, Mitigation Measure WASR-4 "Implement Protection, Restoration, and Improvement Measures to Benefit Hydrologic Functions Within the Lower McCloud River Watershed" has been added to address impacts to free-flowing conditions. Although the Final EIS includes these two mitigation measures, the associated determinations of significance have not been revised.

In addition, Reclamation has revised the Final EIS to clarify that some California state agencies may determine that they are precluded from issuing permits or approvals for the Preferred Alternative or another action alternative and that the State of California will need to determine whether Proposition 1, "Water Bond. Funding for Water Quality, Supply, Treatment, and Storage Project," funds can be used to support the Preferred Alterative or another action alternative. Although the action alternatives would affect the resources identified in the California Public Resources Code Section 5093.542, NEPA obligates the Federal agency to disclose the consequences of the Federal action, which can include consideration of alternatives that may be inconsistent with existing State or Federal law.

Some commenters questioned whether the DEIS comports with NEPA, given the limitation on some State agencies under California Public Resources Code Section 5093.542(c). Section 5093.542(c) states:

> *"Except for participation by the Department of Water Resources in studies involving the technical and economic feasibility of enlargement of Shasta Dam, no department or agency of the state shall assist or cooperate with, whether by loan, grant, license, or otherwise, any agency of the Federal, state, or local government in the planning or construction of any dam, reservoir, diversion, or other water impoundment facility that could have an adverse effect on the free-flowing condition of the McCloud River, or on its wild trout fishery."*

Some State agencies have not participated in developing the SLWRI or the associated EIS, but several California agencies have interpreted the California Public Resources Code as allowing them to participate in technical efforts within their jurisdiction so that Reclamation would have sufficient information available to evaluate the environmental impacts of the action alternatives. Those State agencies include the Natural Resources Agency (CDFW, DWR) and the Central Valley Regional Water Quality Control Board. In addition, DWR has participated in studies involving the technical and economic feasibility of enlargement of Shasta Dam, which is sanctioned by Section 5093.542c of the California Public Resources Code. Generally, Reclamation cannot force any State agency to participate, let alone cooperate, in the development of an EIS for a proposed Reclamation project, including the SLWRI EIS. But that does not mean that Reclamation cannot reasonably analyze a project's potential impacts. In this case, stakeholders and agencies, including some State agencies, participated in the scoping process and discussions with Reclamation. Reclamation used information provided through these means and performed focused studies to document resource conditions and evaluate the potential impacts of the range of alternatives developed through the SLWRI feasibility study. The tools used to evaluate impacts of the alternatives were selected based on Reclamation's standard practices and input from responsible Federal, State, and local agencies and subject matter experts. To perform the appropriate level of analysis for an EIS, Reclamation used the best available information on State-managed resources and took the requisite hard look at potential impacts of the SLWRI based on the best available technical data.

WASR-8 – Effects to the Eligibility of Rivers for Inclusion in the Federal Wild and Scenic River System

Several commenters stated that the DEIS did not fully disclose the fact that the Sacramento and McCloud rivers were included in the Nationwide Rivers Inventory (NRI) and lacked a discussion of how Reclamation considered the impacts on listed river segments in the DEIS, as required under Section 5(d)(1) of the Federal Wild and Scenic

Rivers Act. They also pointed out that if a river is listed in the NRI, the Federal agency involved with the action must consult with the land managing agency, or the National Park Service if the river is on private lands, to attempt to avoid or mitigate adverse effects. The NRI, first initiated in 1979 and now populated with hundreds of river segments, identified four river segments in the SLWRI study area as eligible for listing in the national system, one segment of the McCloud River and three segments of the Sacramento River. To be eligible, a river segment must possess a free-flowing character and contain one or more natural, cultural, or recreational ORVs. No segments of river in the Sacramento or McCloud River systems have been designated as a Wild and Scenic River under Federal law. However, the eligibility of some segments of the Sacramento and McCloud River systems for inclusion in the national Wild and Scenic River System could be affected by the proposal to raise Shasta Dam. Three NRI segments are on the Sacramento River below the Shasta Dam. These were evaluated and determined to be eligible for the NRI in the BLM's Redding Resource Management Plan (RMP: A-16) and are identified in Chapter 18, "Recreation and Public Access," of the DEIS, The ORVs on these reaches could be adversely affected by changes in flows if the height of Shasta Dam is raised. The fourth reach is on the lower McCloud River above Shasta Dam. A fifth river segment on the mainstem of the Sacramento River above Shasta Dam was not identified in the NRI, but was determined to be eligible by the USFS through the LRMP inventory and planning process for the STNF.

Changes in pool elevation will seasonally affect the free-flowing condition and water quality in those segments of the McCloud and Sacramento rivers where they enter Shasta Lake. The DEIS analyzed impacts to the eligibility of the McCloud River in Chapter 25, "Wild and Scenic River Considerations for the McCloud River," but did not address impacts on affected eligible segments of the Sacramento River above and below the dam. Text has been added to the Final EIS in Chapter 17, "Land Use," to address impacts on potential ORVs on affected reaches of the Sacramento River. The affected segments of rivers listed are shown in Table 33.3-6 below.

Table 33.3-6. Affected Segments of Rivers

River	Potentially Affected Eligible Segment	ORVs	Responsible Federal Agency
Sacramento	Below Shasta Dam, Arnold Bend above Colusa to Red Bluff Diversion Dam.	Recreation and Fishing	Bureau of Land Management; US Fish and Wildlife Service (Corning to Colusa)
Sacramento	Below Shasta Dam, Interstate Highway 5 bridge crossing immediately north of Red Bluff to Interstate Highway 5 bridge crossing at Anderson.	Scenery, Recreation, Fishing, Wildlife and Other Values.	Bureau of Land Management
Sacramento	Below Shasta Dam, Balls Ferry Bridge to gaging station below Sevenmile Creek	Scenery, Recreation, Fishing, Heritage	Bureau of Land Management
Sacramento	Above Shasta Dam at the transition reach where the Sacramento River flows into Shasta Lake	Cultural/Historical, Fisheries, Geology, Visual Quality/Scenery	Shasta-Trinity National Forest
McCloud	Above Shasta Dam at the transition reach where the McCloud River flows into Shasta Lake	Cultural/Historical, Fisheries, Geology, Visual Quality/Scenery	Shasta-Trinity National Forest

The Wild and Scenic Rivers Act does not prohibit water developments that may affect portions of rivers that are eligible for inclusion in the national Wild and Scenic Rivers System, except on rivers designated by Congress under Section 5(a) of the Act. The Sacramento and McCloud rivers have not been designated by Congress under Section 5(a) of the Wild and Scenic Rivers Act. Section 5(d)(1) of the Wild and Scenic Rivers Act requires that, in all planning for the use and development of water and related land resources, consideration shall be given by all Federal agencies involved to potential national wild, scenic, and recreational river areas. The EIS fully considers and discloses the effects of raising Shasta Dam on the ORVs and wild and scenic eligibility of the McCloud River in Chapter 25, “Wild and Scenic River Considerations for the McCloud River.” The EIS provides additional information about potential effects to the eligible reaches of the Sacramento River in Chapter 17, “Land Use.”

33.3.20 Master Comment Responses for Relationship to BDCP

BDCP-1 – Relationship of the SLWRI to the Bay Delta Conservation Plan

Several comments reflect concerns regarding potential inter-relationships between the SLWRI and BDCP.

The SLWRI is being studied under a separate authorization that is not predicated on the outcome of the BDCP. SLWRI action alternatives were evaluated independently of the BDCP process. The potential water conveyance facilities and other conservation measures of the BDCP were not incorporated into SLWRI action alternatives or Existing Conditions scenarios. Accordingly, all potential benefits of SLWRI action alternatives, such as estimated increases in fisheries benefits and agricultural and municipal and industrial water supply reliability, were evaluated in the absence of any of the potential BDCP alternative conveyance facilities and other conservation measures.

As stated above, the BDCP is not included as a project under the No-Action Alternative for the SLWRI. As described in Chapter 2, "Alternatives," of the DEIS and Final EIS, Section 2.2, "No-Action Alternative," projects included in the No-Action Alternative include those with current authorization, secured funding for design and construction, and environmental permitting and compliance activities that are substantially complete. Since the BDCP is still in the planning phase and no specific plan has been approved for implementation, it does not meet these criteria and is not included as a project under the No-Action Alternative.

The BDCP is, however, considered in the cumulative effects analysis for the SLWRI, which is described in the DEIS Chapter 3, "Considerations for Describing Affected Environment and Environmental Consequences," Section 3.2.9, "Cumulative Effects." As described, the BDCP is considered qualitatively in the assessment of cumulative effects of SLWRI action alternatives for each resource area, as applicable. For more information about the BDCP cumulative effects analysis, please see Master Comment Response EI-7, "Bay Delta Conservation Plan Too Speculative to Provide Meaningful Quantitative Cumulative Analysis in the SLWRI EIS."

As stated above, the SLWRI is being studied under a separate authorization from the BDCP and BDCP facilities and measures were not incorporated into SLWRI action alternatives. Furthermore, the BDCP was not incorporated into SLWRI No-Action Alternative or Existing Conditions scenarios because it is still in the planning phase and no specific plan has been approved for implementation, and therefore does not meet the criteria for inclusion. Accordingly, the

SLWRI is separate from the BDCP, and SLWRI action alternatives, including benefits of action alternatives, do not depend on implementation of the BDCP. With SLWRI having five action alternatives and the BDCP having 15 conveyance action alternatives, it is not possible to provide a meaningful quantitative evaluation of all the potential combinations of actions at this time. However, consistent with CEQ Regulations, the BDCP was considered in the assessment of cumulative effects of SLWRI action alternatives for each resource area.

Operation of new conveyance facilities and/or flow patterns proposed under the BDCP would require changes in existing CVP operations, as described in the BDCP DEIR/S. Similarly, operation of additional storage and/or flow patterns proposed under the SLWRI would also require changes in existing CVP operations as detailed in the EIS. Reclamation agrees that the SLWRI and the BDCP will need to be coordinated in terms of operations should both of these projects be implemented, just as the CVP and SWP operations are currently coordinated through the Coordinated Operations Agreement (COA) and operations described in the 2008 Long-Term Operation BA.

33.3.21 Master Comment Responses for Reservoir Area Hydrology

RAH-1 – Available Water to Fill an Enlarged Reservoir

Several commenters raised a concern that because Shasta Reservoir only fills to the top of the dam occasionally, and that enlarging Shasta Dam will not cause inflow to increase, that an even larger reservoir would not fill and is not needed. It is true that enlarging Shasta Dam will not cause inflow to increase; the increased storage will allow more efficient reservoir operations that capture and store water that is currently released downstream as part of flood control operations.

Shasta Dam is currently operated for multiple purposes including water supply, fisheries flows and flood control. Flood control operations are regulated by USACE criteria which include safe releases downstream and the reservation of empty storage capacity during the flood season for capturing runoff events. As the flood season ends, this storage space is gradually reduced and can be filled for other purposes, however, because of uncertainty in weather and inflow forecasts and other operational restrictions the reservoir is not allowed to be completely filled during the wet season when flood control capacity may still be needed and as a consequence the reservoir rarely completely fills. With additional storage capacity available there is additional operational flexibility to allow capture of additional flows during the flood season resulting in additional water in storage even if the reservoir does not completely fill each year. To evaluate the impact of the additional storage available for non-flood control purposes for each alternative over a range of rainfall year types, modeling is used.

Shasta Reservoir and its flood control operations are described in the DEIS in Chapter 6, "Hydrology, Hydraulics, and Water Management," Section 6.1.5, "Flood Management, Shasta Lake and Vicinity." Additional details on the flood control requirements and operations are included in Section 6.2, "Regulatory Framework," Subsection 6.2.1, "Federal, Flood Management Requirements." Shasta operations for each alternative under these requirements were simulated with the CalSim-II CVP/SWP simulation model, the best available tool for predicting system-wide water operations throughout the Central Valley. Details on the CalSim-II model and the assumptions included in all simulations can be found in Chapter 6, "Hydrology, Hydraulics and Water Management," Section 6.3, "Environmental Consequences and Mitigation Measures," and Section 6.3.1, "Methods and Assumptions," and in the Modeling Appendix, Chapter 2, "CalSim-II." Flood operations at Shasta Lake are simulated based on regulatory requirements to maintain specific volumes of available, or empty, storage over the course of a year for protection against future flood events. During a flood event the high inflows are first captured in Shasta Lake up to the regulatory storage limits. When the flood control storage limits are met, releases are increased up to the safe downstream channel capacity. If the inflows are greater than the safe downstream channel capacity the regulatory storage limits can be exceeded and the excess inflow stored in Shasta Lake. When the high inflows reduce, the stored flood water is released from Shasta Lake until the storage reaches the regulatory limits to provide protection for future flood events. These flood control releases occur before Shasta Lake is physically full; they are driven by the flood control storage regulatory limitations.

The following Table 33.3-7 shows the number of months and years that Shasta Reservoir reaches the regulatory flood control storage limit in both the Existing Condition and Future No-Action Alternative in the CalSim-II simulations. During these months there is the possibility that Shasta Reservoir may need to make flood control releases to maintain the regulatory flood control limit. The enlarged Shasta Lake allows capture of a portion of these releases due to the larger available usable storage under the flood control storage limits.

Table 33.3-7. Number of Months and Years Shasta Reservoir Reaches Regulatory Flood Control Storage Limit for Existing and Future No-Action Alternative

Year Type	Total Months and Years in Category		Existing Condition		Future No-Action Alternative	
	#Months	#Years	#Months	#Years	#Months	#Years
Wet	312	26	153	26	139	26
Above Normal	144	12	36	12	30	11
Below Normal	168	14	14	7	15	8
Dry	216	18	8	4	7	4
Critical	144	12	1	1	0	0
Total	984	82	212	50	191	49

RAH-2 – Reservoir Surface Area with Reservoir Enlargement

Several comments were received that requested data on the surface area of Shasta Lake be provided under the various reservoir enlargements.

The operations of Shasta Reservoir, including surface area were simulated with the CalSim-II CVP/SWP simulation model, the best available tool for predicting system-wide water operations throughout the Central Valley. Details on the CalSim-II model and the assumptions included in all simulations can be found in in the DEIS in Chapter 6, "Hydrology, Hydraulics and Water Management," Section 6.3, "Environmental Consequences and Mitigation Measures," and Section 6.3.1, "Methods and Assumptions," and in the Modeling Appendix, Chapter 2, "CalSim-II." The CalSim-II simulation includes simulation of the surface area of Shasta Lake for each time period.

The following Table 33.3-8 is a summary of the simulated mean annual Shasta Lake surface area in acres for each alternative for all years and by water year type. Full output tables of the monthly Shasta Lake surface area are included in the Final EIS.

Table 33.3-8. Mean Annual Shasta Lake Surface Area in Acres

Year Type	Existing Conditions						
	Baseline	**CP1**	**CP2**	**CP3**	**CP4[1]**	**CP4A[1]**	**CP5**
All Years	23,247	24,063	24,753	25,296	25,886	25,657	25,235
Wet	25,733	26,834	27,611	28,345	28,448	28,399	28,326
Above Normal	24,679	25,611	26,223	26,860	27,331	27,073	26,844
Below Normal	23,593	24,285	25,070	25,617	26,137	25,988	25,489
Dry	22,539	23,245	23,811	24,368	25,154	24,771	24,280
Critical	17,087	17,477	18,132	18,145	19,699	19,245	18,068
Year Type	**Future Conditions**						
	No Action	**CP1**	**CP2**	**CP3**	**CP4[1]**	**CP4A[1]**	**CP5**
All Years	23,310	24,098	24,626	25,200	25,920	25,535	25,129
Wet	25,704	26,776	27,532	28,264	28,396	28,324	28,254
Above Normal	24,618	25,540	26,137	26,792	27,258	26,985	26,738
Below Normal	23,691	24,479	24,997	25,513	26,318	25,916	25,534
Dry	22,565	23,136	23,578	24,077	25,048	24,543	24,040
Critical	17,486	17,854	17,958	18,287	20,057	19,084	17,909

Note:
[1] Results for CP4 and CP4A are postprocessed based on operations modeling results from CP1 and CP2 respectively.

RAH-3 – Dry Year Effects to Reservoir Storage

This comment concerns the reservoir not refilling in dry years when the water supply is low. The purpose of any water supply reservoir is to capture and store excess flows during periods of high inflow and store them for release and use during periods of low inflow. With this operation the reservoir is expected to get lower in dry years to supplement the natural runoff and then refill in wetter years to store water for use in future dry years.

This operation was simulated with the CalSim-II CVP/SWP simulation model, the best available tool for predicting system-wide water operations throughout the Central Valley. Details on the CalSim-II model and the assumptions included in all simulations can be found in the DEIS in Chapter 6, "Hydrology, Hydraulics and Water Management," Section 6.3, "Environmental Consequences and Mitigation Measures," and Section 6.3.1, "Methods and Assumptions," and Modeling Appendix, Chapter 2, "CalSim-II." Water supply operations simulated in the model attempt to capture excess flood flows during periods of high runoff and store them for use during periods of low runoff.

The following Table 33.3-9 shows the average maximum annual storage for each year type from the CalSim-II simulation modeling. The table shows, in thousands of acre-feet, that the reservoir tends to fill more in wet years than in dry years as explained above. The table also shows that with the project the reservoir also contains more water in dry and critical years meaning that additional stored water is being carried over from wetter years to supplement water supply during the drier years.

Table 33.3-9. Average Maximum Annual Storage for Each Year Type

Year Type	Existing Conditions						
	Baseline	**CP1**	**CP2**	**CP3**	**CP4[1]**	**CP4A[1]**	**CP5**
All Years	4032	4217	4371	4501	4595	4562	4497
Wet	4485	4731	4916	5106	5109	5107	5106
Above Normal	4484	4711	4872	5030	5089	5063	5035
Below Normal	4123	4304	4462	4605	4682	4653	4586
Dry	3880	4031	4153	4269	4409	4344	4262
Critical	2723	2788	2907	2891	3166	3098	2888
Year Type	**Future Conditions**						
	No Action	**CP1**	**CP2**	**CP3**	**CP4[1]**	**CP4A[1]**	**CP5**
All Years	4044	4228	4357	4495	4606	4548	4483
Wet	4483	4730	4915	5105	5108	5106	5105
Above Normal	4481	4707	4868	5036	5085	5059	5028
Below Normal	4152	4334	4463	4598	4712	4654	4588
Dry	3884	4012	4112	4215	4390	4303	4221
Critical	2770	2859	2878	2933	3237	3069	2863

Note:
[1]Results for CP4 and CP4A are postprocessed based on operations modeling results from CP1 and CP2 respectively.

RAH-4 – Historic Operations vs. Simulated Operations Used for Alternatives Evaluations

Several commenters expressed concerns over differences in observed historical conditions and operations modeling results presented in the EIS.

The potential operations and impacts of the SLWRI were not evaluated using direct statistical analysis, they were estimated by simulation of the existing operations and anticipated future operations of Shasta Lake under each of the alternative assumptions using historically-based precipitation patterns. Operations modeling is commonly used to develop information on the anticipated operations and impacts of a wide range of water resource projects during project planning, design, and to aid in development of operational rules.

For the SLWRI operations modeling was performed using the CalSim-II CVP/SWP simulation model, the best available tool for predicting system-wide water operations throughout the Central Valley. Details on the CalSim-II model and the assumptions included in all simulations can be found in the DEIS in Chapter 6, "Hydrology, Hydraulics and Water Management," Section 6.3, "Environmental Consequences and Mitigation Measures," and Section 6.3.1, "Methods and Assumptions," and in the Modeling Appendix, Chapter 2, "CalSim-II." As described in the documentation the CalSim-II model is not based on, and does not use, statistical data or methods, it is a level of demand simulation model that simulates the response of the CVP/SWP systems to a specifically developed set of hydrologic conditions. These simulations represent a way to compare the performance of alternatives under future landuse conditions. They do not provide absolute measurements of future operations given unknown precipitation and climate change. For climate change scenarios, please refer to Climate Change Modeling Attachment.

33.3.22 Master Comment Responses for Reservoir Evaporation

RE-1 – Reservoir Evaporation

Commenters were concerned that the increase in evaporation with the increasing surface area of the project action alternatives would result in a net reduction in yield from the SLWRI. The potential evaporation from the increased Lake Shasta water surface area was estimated and used in the simulation of the operations of the action alternatives. All increases in water supplies documented in the DEIS represent the net increases after additional evaporation from increased Shasta Lake surface area.

Operations modeling for the SLWRI was performed using the CalSim-II CVP/SWP simulation model, the best available tool for predicting system-wide water operations throughout the Central Valley. Details on the CalSim-II model and the assumptions included in all simulations can be found in the DEIS in Chapter 6, "Hydrology, Hydraulics and Water Management," Section 6.3, "Environmental Consequences and Mitigation Measures," and Section 6.3.1, "Methods and Assumptions," and in the Modeling Appendix, Chapter 2, "CalSim-II." The simulation includes estimates of reservoir evaporation based on storage and surface area at all reservoirs including Shasta Lake. All final storages, releases, and deliveries are simulated with consideration of changes in evaporation due to changes in reservoir surface area.

The following table is a summary of the simulated mean annual Shasta Lake evaporation in thousands of acre-feet for each alternative for all years and by water year type. Full output tables of the monthly Shasta Lake evaporation are included in the Final EIS.

Table 33.3-10. Mean Annual Shasta Lake Evaporation in TAF

Year Type	Existing Conditions						
	Baseline	**CP1**	**CP2**	**CP3**	**CP4[1]**	**CP4A[1]**	**CP5**
All Years	129	134	137	140	143	142	140
Wet	144	149	153	157	158	157	157
Above Normal	142	147	151	154	156	155	154
Below Normal	131	135	139	142	145	144	142
Dry	124	128	131	134	138	136	133
Critical	91	93	97	97	105	103	96
Year Type	**Future Conditions**						
	No Action	**CP1**	**CP2**	**CP3**	**CP4[1]**	**CP4A[1]**	**CP5**
All Years	130	134	137	140	144	142	139
Wet	143	149	153	157	157	157	157
Above Normal	142	147	150	154	156	155	154
Below Normal	132	136	139	142	146	144	142
Dry	124	127	130	132	137	135	132
Critical	94	95	96	98	108	102	95

Note:
[1]Results for CP4 and CP4A are postprocessed based on operations modeling results from CP1 and CP2 respectively.

33.3.23 Master Comment Responses for Water Supply Reliability Benefits & Beneficiaries

WSR-1 – Water Supply Demands, Supplies, and Project Benefits
During the public comment period, comments were received regarding the purpose and objectives of the project, particularly the objective related to increased water supply reliability. Some comments raised concerns regarding the potential beneficiaries of improved water supply reliability (e.g., existing CVP and SWP water contractors), while other commenters identified the need for improved water conservation and related practices.

Purpose, Need, and Objectives
Project Purpose The Project Purpose was revised for clarification in the Final EIS (Chapter 1, "Introduction," Section 1.2.1, "Project Purpose and Objectives") as follows:

> *…to improve operational flexibility of the Sacramento-San Joaquin Delta (Delta) watershed system to meet specified primary and secondary project objectives.*

The Project Purpose statement in the Final EIS was revised to reflect the fact that many measures/alternatives were considered in the plan formulation process other than measures that would modify or raise Shasta Dam. As explained in ALTR-1, "Range of Alternatives – General", the Final EIS was also revised to clarify that Reclamation not

only considered the CALFED Final PEIS/R in analyzing the environmental impacts of the SLWRI, but that this EIS tiers to the CALFED Final PEIS/R. These revisions were primarily made in EIS Chapters 1, "Introduction," Chapter 2, "Alternatives," and Chapter 3, "Considerations for Describing Affected Environment and Environmental Consequences," and in Plan Formulation Appendix Chapter 2, "Management Measures."

The CALFED development process is also fully explained in ALTR-1, "Range of Alternatives – General." In developing the CALFED Final PEIS/R, the CALFED agencies, including Reclamation, evaluated a broad range of water management options (with and without storage) to be implemented to achieve the CALFED goals. Numerous alternatives were considered for improving ecosystem quality and water supply reliability, as well as water quality and levee system integrity. Many of those alternatives were rejected through the CALFED process. The CALFED Programmatic ROD (page 6) specifically states that "documents tiering from the CALFED [Final PEIS/R] will not revisit the alternatives that were rejected during CALFED's alternative development process." Additionally, as explained in ALTR-1, "Range of Alternatives - General," Reclamation undertook a derivative, similar process for identifying reasonable alternatives in developing the action alternatives (i.e., comprehensive plans) for the SLWRI. Reclamation evaluated many alternatives, or management measures, beyond simply modifying or raising Shasta Dam. To reflect the much broader range of alternatives considered through the CALFED development process and in the SLWRI plan formulation process, the SLWRI Purpose statement has been revised as described above. Reclamation's purpose and need statement is reasonable and did not foreclose a reasonable range of alternatives.

Objectives On the basis of needs described below, the study authorities, and other pertinent direction, including the August 2000 CALFED Programmatic ROD, primary and secondary planning objectives were developed. The two primary project objectives (also referred to as planning objectives) and five secondary project objectives were developed for the SLWRI are:

- **Primary Project Objectives**

  - Increase the survival of anadromous fish populations in the Sacramento River, primarily upstream from the Red Bluff Pumping Plant (RBPP)

  - Increase water supply and water supply reliability for agricultural, M&I, and environmental purposes, to help

meet current and future water demands, with a focus on enlarging Shasta Dam and Reservoir

- **Secondary Project Objectives**

  - Conserve, restore, and enhance ecosystem resources in the Shasta Lake area and along the upper Sacramento River

  - Reduce flood damage along the Sacramento River

  - Develop additional hydropower generation capabilities at Shasta Dam

  - Maintain and increase recreation opportunities at Shasta Lake

  - Maintain or improve water quality conditions in the Sacramento River downstream from Shasta Dam and in the Delta

Primary project objectives are those which specific alternatives are formulated to address. The two primary project objectives are considered to have coequal priority, with each pursued to the maximum practicable extent without adversely affecting the other. Secondary project objectives are considered to the extent possible through pursuit of the primary project objectives.

Some commenters suggest that the Primary Objectives are too narrowly drawn because "the water supply goal includes a 'focus on enlarging Shasta Dam and Reservoir.'" The objective, however, merely recognizes that studying the feasibility of raising Shasta Dam and Reservoir was not only an approved project in the CALFED Programmatic ROD, but authorized by two Federal statutes. If Reclamation did not provide some focus on raising Shasta Dam and Reservoir in the SLWRI plan formulation process, including the Final EIS, one could question Reclamation's authority to conduct the study in the first place. The objective does not state that Reclamation would not consider non-Shasta Dam enlargement alternatives, and nothing in the objective precludes Reclamation from doing so. The objective's focus on Shasta Dam and Reservoir did not preclude Reclamation from considering other alternatives in the SLWRI plan formulation and alternative development process. As noted above, Reclamation considered numerous alternatives through the CALFED and SLWRI alternatives development processes. The Project's primary objectives are reasonable and did not preclude Reclamation from considering a reasonable range of alternatives.

Project Need As summarized in the Executive Summary and further described in Chapter 1 "Introduction," of the DEIS, the need for the SLWRI is for:

- **Anadromous Fish Survival** – The Sacramento River system supports four separate runs of Chinook salmon: fall-, late fall-, winter-, and spring-run. The adult populations of the four runs of salmon and other important fish species that spawn in the upper Sacramento River have considerably declined over the last 40 years. Several fish species in the upper Sacramento River have been listed under the Federal Endangered Species Act: Sacramento River winter-run Chinook salmon (endangered), Central Valley spring-run Chinook salmon (threatened), Central Valley steelhead (threatened), and the Southern Distinct Population Segment of North American green sturgeon (threatened). Two of these species are also listed under the California Endangered Species Act: Sacramento River winter-run Chinook salmon (endangered) and Central Valley spring-run Chinook salmon (threatened).

  Unsuitable water temperatures in the upper Sacramento River, especially in dry and critical years is a critical factor affecting the abundance of Chinook salmon and steelhead in the river. Water temperatures that are too high or, less commonly, too low, can be detrimental to the various life stages of Chinook salmon. Elevated water temperatures can negatively impact holding and spawning adults, egg viability and incubation, preemergent fry, and rearing juveniles and smolts, significantly diminishing the next generation of returning spawners. Stress caused by high water temperatures also may reduce the resistance of fish to parasites, disease, and pollutants. Releases of cold water from Shasta Reservoir can improve seasonal water temperatures in the Sacramento River downstream from Shasta Dam for anadromous fish during critical periods.

  Various Federal, State, and local projects are addressing factors contributing to declines in anadromous fish populations. Recovery actions range from changing the timing and magnitude of reservoir releases to structural changes at Shasta Dam. Despite these steps, additional actions are needed to address anadromous fish survival in the upper Sacramento River.

- **Water Supply Reliability** – Demands for water in California exceed available supplies. Reclamation's 2008 Water Supply and Yield Study describes dramatic increases in statewide population, land use changes, regulatory requirements, and

limitations on storage and conveyance facilities that have resulted in unmet water demands and subsequent increases in competition for water supplies among urban, agricultural, and environmental uses. The California Department of Water Resources (DWR) California Water Plan Update 2013 concludes that California is facing one of the most significant water crises in its history; drought impacts are growing, and climate change is affecting statewide hydrology. Challenges are greatest during drought years, when water supplies are less available.

As the population of California grows, and the demand for adequate water supplies becomes more acute, the ability to maintain a healthy and viable industrial and agricultural economy while protecting aquatic species will be increasingly difficult. Compounding these issues, potential effects of climate change, such as changed precipitation patterns, less snowfall, and earlier snowmelt, may considerably increase the demands on available water supplies in the future. As owner and operator of the CVP, one of the largest water storage and conveyance systems in the world, Reclamation has identified the need to increase the reliability of CVP water deliveries to its water contractors, particularly during dry and critical water years. Similar needs and challenges are faced by the SWP and other water projects throughout the State. As one of many efforts to improve the reliability of California's water supply, the SLWRI was established to evaluate the potential to improve water supply reliability, primarily by modifying Shasta Dam and enlarging Shasta Lake.

- **Ecosystem Resources** – The quantity, quality, diversity, and connectivity of riparian, wetland, floodplain, and shaded riverine habitat in the Sacramento River ecosystem have been severely limited through confinement of the river system by levees, reclamation of adjacent lands for farming, bank protection, construction of dams and reservoirs, channel stabilization, and land development. This has contributed to a decline in habitat and native species populations. Ecosystem restoration along the Sacramento River has been the focus of several ongoing programs, including the Senate Bill 1086 Program, CVPIA, CALFED, Central Valley Habitat Joint Venture (CVHJV), and numerous local programs within the Central Valley. Despite these efforts, a significant need remains to conserve and restore ecosystem resources along the Sacramento River.

- **Flood Management** – Communities and agricultural lands in the Central Valley are subject to flooding along the Sacramento River that poses risks to human life, health, safety, and property. Physical impacts from flooding include damage to buildings, contents, automobiles, agricultural crops, and equipment. Threats from flooding are caused by many factors, including overtopping or sudden failures of levees, which can result in deep and rapid flooding with little warning. In addition, urban development in flood-prone areas has exposed the public to the risk of flooding.

- **Hydropower** – Although California is the most energy-efficient state per capita in the Nation, demands for electricity are growing at a rapid pace. Over the next 10 years, California's peak demand for electricity is expected to increase 30 percent, from about 50,000 megawatts (MW) to about 65,000 MW. In addition, Executive Orders S-14-08 and S-21-09, issued in 2008 and 2009, respectively, established a goal of using renewable energy sources, including hydropower, for 33 percent of the State's energy consumption by 2020. To meet renewable energy goals, significant increases in non-dispatchable intermittent renewable resources, such as wind and solar generation, will need to be added to California's power system. This means that other significant flexible generation resources, such as hydropower, will be needed to support and integrate renewable generation.

- **Recreation** – As California's population continues to grow, demands will increase substantially for water-oriented recreation at and near the lakes, reservoirs, streams, and rivers of the Central Valley. Further increases in demand, accompanied by relatively static recreation resources, will cause issues at existing recreation areas. These challenges will be especially pronounced at Shasta Lake, which is one of the most visited recreation destinations in the state and in the region. Even under current levels of demand, USFS, which manages recreation at Shasta Lake, has expressed concern about seasonal capacity problems at existing marinas and USFS facilities. A substantial and increasing need exists to improve recreation-related facilities and conditions at Shasta Lake.

Water Quality – The Sacramento River and the Delta support fish and wildlife while providing water supplies for urban, agricultural, and environmental uses across the state. Saltwater intrusion, municipal discharges, agricultural drainage, and water project flows and diversions have led to water quality issues within the Delta, particularly related to salinity. In the Sacramento River, urban and agricultural runoff, and

runoff and seepage from abandoned mining operations, have resulted in elevated levels of pesticides, phosphorous, mercury, and other metals. Additional operational flexibility could provide opportunities to improve Sacramento River and Delta water quality conditions.

Planning Constraints and Considerations As described in Chapter 2, "Alternatives," Section 2.1.1, "Plan Formulation Process," of the DEIS, consistent with NEPA, the plan formulation process for Federal water resources studies and projects identified in the P&G begins with identifying existing and projected future resources conditions likely to occur in a study area. This is followed by defining water resources problems, needs, and opportunities to be addressed, and developing planning objectives, constraints, and criteria. For the SLWRI, this process was separated into five phases, all of which have been completed and are described in Section 2.1, "Alternatives Development Process," of the DEIS. The SLWRI-specific planning constraints and considerations are summarized in Chapter 2, "Alternatives," Section 2.1.3 "Planning Constraints and Other Considerations," of the DEIS and described in more detail in the Draft Plan Formulation Appendix of the DEIS. Planning constraints help guide the plan formulation process.

Some planning constraints are more rigid than others. Examples of more rigid constraints include congressional direction in study authorizations; other current applicable laws, regulations, and policies; and physical conditions (e.g., topography, hydrology). Other planning constraints are less restrictive but are still influential in guiding the process. Planning considerations were specifically identified to help formulate, evaluate, and compare initial plans and, later, detailed alternatives.

Basis of Analysis and Assumptions Reclamation as the lead agency has determined the appropriate base line assumptions and tools for analysis and has consulted other agencies, tribal members, and the public through the scoping process. Detailed discussions of the methods and assumptions for each resource area are included in Section 3.1, "Methods and Assumptions," of Chapters 4 through 25 of the DEIS.

Potential Benefits of Action Alternatives As described in Chapter 6, "Hydrology, Hydraulics, and Water Management," of the DEIS, at a base level, each action alternative would store some additional flows behind Shasta Dam during periods when the flows would have otherwise been released downstream. The resulting increase in storage would then be used to both create an expanded cold-water pool, thus benefiting fisheries, and for subsequent release downstream when there are opportunities to put the water to beneficial use. Each of the action alternatives would contribute in varying degrees to all of the primary and secondary project objectives, and provide benefits both north and south of the Delta.

A summary of major potential benefits of the action alternatives is included in the Executive Summary, Section S.6.7, "Summary of Comprehensive Plan Physical Features and Benefits," of the EIS.

Potential Beneficiaries of Action Alternatives Chapter 6, "Hydrology, Hydraulics, and Water Management," Section 6.2, "Environmental Consequences and Mitigation Measures," of the DEIS addresses benefits of the action alternatives on deliveries to CVP water service contractors and refuges, and SWP contractors, as well as changes in allocations to municipal and industrial (M&I), and agricultural water service contractors, and refuges. As discussed in Chapter 6, "Hydrology, Hydraulics, and Water Management," Section 6.1.4, "Surface Water Supply," of the DEIS, the CVP provides water to settlement contractors in the Sacramento Valley, exchange contractors in the San Joaquin Valley, agricultural and M&I water service contractors in both the Sacramento and San Joaquin valleys, and wildlife refuges both north and south of the Delta. The SWP operates under long-term contracts with public water agencies throughout California. These agencies, in turn, deliver water to wholesalers or retailers, or deliver it directly to agricultural and M&I water users.

The SLWRI No-Action Alternative and action alternatives would not include changes to any rules and regulations that govern operations at Shasta Dam in the form of flood control requirements, flow requirements, water quality requirements, and water supply and hydropower commitments. SLWRI alternatives would not supersede existing laws or regulations and does not exempt any actions from compliance with applicable laws, including NEPA or Federal Endangered Species Act (ESA). SLWRI alternatives would not increase existing maximum CVP or SWP contract quantities or expand the place of use. Similarly, SLWRI action alternatives would not modify existing priorities for water supply deliveries. The power generated by the CVP is marketed through contracts with the Western Area Power Administration (Western). Changes in Western's priorities are not anticipated to change under SLWRI action alternatives.

A summary of major potential benefits of the action alternatives is included in the Executive Summary, Section S.6.7, "Summary of Comprehensive Plan Physical Features and Benefits," of the EIS.

Water Conservation, Water Use Efficiency, and Water Recycling As described in Chapter 2, "Alternatives," of the DEIS, all action alternatives include a water conservation program to augment current water use efficiency practices. The proposed program would consist of a 10-year initial program to which Reclamation would allocate approximately $1.6 million to $3.8 million to fund water conservation efforts. Funding would be proportional to additional water supplies

delivered and would focus on assisting project beneficiaries (agencies receiving increased water supplies because of the project), with developing new or expanded agricultural and M&I water conservation and water recycling programs. Program actions would be a combination of technical assistance, grants, and loans to support a variety of water conservation projects, such as recycled wastewater projects, irrigation system retrofits, and urban utilities retrofit and replacement programs. The program could be established as an extension of existing Reclamation programs, or as a new program through teaming with cost-sharing partners. Combinations and types of water use efficiency actions funded would be tailored to meet the needs of identified cost-sharing partners, including consideration of cost-effectiveness at a regional scale for agencies receiving funding.

Compliance with Existing Contract Terms, Laws, and Regulations
The No-Action Alternative and action alternatives do not include changes to existing CVP or SWP contract terms. SLWRI does not supersede existing laws or regulations and does not exempt any actions from compliance with applicable laws, including NEPA or ESA. The Federal, State, and local regulatory framework for the SLWRI is generally described in Chapter 3, "Considerations for Describing Affected Environment and Environmental Consequences," Section 3.4, "Regulatory Framework," of the DEIS. Chapters 4 through 25 contain more detailed discussions of the "Regulatory Framework" by resource area. In addition, Chapter 26, "Other Required Disclosures," further describes the Federal and State laws, rules and regulations, Executive Orders, and compliance requirements that may be required if an alternative is selected for implementation.

WSR-8 – Action Alternatives Don't Meet All Water Demands
Several comments reflect concerns regarding the ability of any of the action alternatives to meet all future water demands (CVP, SWP, and other demands statewide).

As stated in Chapter 1, "Introduction," Section 1.2.1, "Project Purpose and Objectives," of the Final EIS, one of the primary project objectives relates to increasing "…water supply and water supply reliability…to help meet current and future water demands…". However, meeting all water needs in the State of California is not within the purpose or objectives of the project. As described in Chapter 6, "Hydrology, Hydraulics, and Water Management," Section 6.3.3, "Direct and Indirect Effects," of the DEIS, all of the action alternatives include enlarging the total storage capacity in the Shasta Reservoir to increase water supply reliability to agricultural and M&I users both north and south of the Delta. CP1, CP2, CP4/4A, and CP5 would also include changing Shasta Dam operational guidelines during dry years and critical years to focus on increasing M&I deliveries.

The No-Action Alternative and action alternatives do not include changes to existing CVP or SWP contract terms, existing contract amounts, or new contracts for water service. SLWRI does not supersede existing laws or regulations and does not exempt any actions from compliance with applicable laws, including NEPA or ESA. The Federal, State, and local regulatory framework for the SLWRI is generally described in Chapter 3, "Considerations for Describing Affected Environment and Environmental Consequences," Section 3.4, "Regulatory Framework," of the DEIS. Chapters 4 through 25 contain more detailed discussions of the "Regulatory Framework" by resource area. In addition, Chapter 26, "Other Required Disclosures," further describes the Federal and State laws, rules and regulations, Executive Orders, and compliance requirements that may be required if an alternative is selected for implementation.

WSR-12 – Increasing Water Supply Reliability under Action Alternatives

Several comments reflect concerns regarding the ability of the action alternatives to increase water supply reliability, particularly for CVP water contractors.

Development and Refinement of Comprehensive Plans As described in Chapter 2, "Alternatives," Section 2.1.6, "Development and Refinement of Comprehensive Plans," of the DEIS, to improve the balance between agricultural and M&I water supply benefits, a portion of the increased storage capacity in Shasta Reservoir was reserved to specifically focus on increasing M&I deliveries during dry and critical years under Comprehensive Plans 1, 2, 4, and 5. Operations targeting increased M&I deliveries were based on existing and anticipated future demands, operational priorities, and facilities of the SWP, which provides M&I water to major regions of the State's population.

In addition, to provide a greater range of focus and operations within the set of comprehensive plans, water supply operations for Comprehensive Plan 3 were focused on agricultural water supply reliability and anadromous fish survival. Accordingly, for Comprehensive Plan 3, none of the increased storage capacity in Shasta Reservoir was reserved for increasing M&I deliveries.

Potential Benefits of Action Alternatives As described in Chapter 6, "Hydrology, Hydraulics, and Water Management," of the DEIS, at a base level, each action alternative would store some additional flows behind Shasta Dam during periods when the flows would have otherwise been released downstream. The resulting increase in storage would then be used to both create an expanded cold-water pool, thus benefiting fisheries, and for subsequent release downstream when there are opportunities to put the water to beneficial use. Each of the action

alternatives would contribute in varying degrees to all of the primary and secondary project objectives, and provide benefits both north and south of the Delta.

A summary of major potential benefits of the action alternatives is included in the Executive Summary, Section S.6.7, "Summary of Comprehensive Plan Physical Features and Benefits," of the DEIS. Under each of the action alternatives, firm water supplies would increase both north and south of the Delta, water use efficiency funding would increase, and emergency water supply response capability would increase.

Each of the SWLRI alternatives would have similar impacts on CVP and SWP operations compared to the No-Action Alternative. However, the magnitude of the impacts would vary according to the alternative. Detailed tables of the estimated monthly flows and storages associated with each alternative, in addition to changes from the basis of comparison, are included in Attachment 1, "CalSim-II Output," of the Modeling Appendix and results are summarized in Chapter 6, "Hydrology, Hydraulics, and Water Management," of the DEIS.

33.3.24 Master Comment Responses for Recreation

REC-1 – Effects to Recreation at Shasta Lake

During the public comment period, comments were received that questioned the determination that recreation would be increased as a result of the project. Several comments expressed concern that a reduction in the number of marinas serving the lake could hurt the recreation business around the lake. Commenters were also concerned about losses of business surrounding Lake Shasta, and the possible loss of residents in the surrounding communities.

Recreation visitation is expected to increase under all action alternatives. The increase in overall recreation visitation is attributed to the anticipated improved lake conditions (surface area, water levels), in conjunction with modernized recreation facilities. All action alternatives would maintain the existing recreation capacity and distribution around Shasta Lake. As summarized in Executive Summary, Table S-2, action alternatives are expected to increase visitation between 89,000 to 370,000 user days a year. Considerations related to increased recreation visitation, and maintain recreation capacity on Shasta Lake include the following.

Increased Recreation Visitation and Access

Recreation User-Day Analysis The Modeling Appendix, Chapter 10, "Recreation Visitation," presents the two methodologies applied and corresponding recreation visitation estimates. These methodologies both

used a combination of the parameters to estimate visitation. The parameters included: positively related to elevation of Shasta Lake in May which is the beginning of the peak visitation season (e.g., distance to water in May), negatively related to the change in reservoir water elevation between May and September (the end of the peak visitation season), and positively related to reservoir surface area. These analyses support the conclusion that an increase in recreation visitation to Shasta Lake would occur under all of the action alternatives.

Public Boat Ramp Access Exceedance Analysis The DEIS Chapter 18, "Recreation and Public Access," Section 18.3.4, "Direct and Indirect Effects," Table 18-5 shows the percent exceedance of the Shasta Lake public boat ramp availability that were simulated using CalSim-II. The results show that with the dam raise the current minimum ramp elevations will be exceeded for a longer period during the recreational season of May-September. Therefore, the boat ramps would be accessible for a longer period of time during the recreational season. Similar trends would be expected for boat ramps at marinas.

Maintaining Recreation Capacity and Facilities Design

Recreation Facility Design Standards As stated in the DEIS Chapter 2, "Alternatives," Section 2.3.1, "Management Measures Common to All Action Alternatives," specifies that all of the action alternatives include features to, at a minimum, maintain the overall recreation capacity of the existing facilities. All action alternatives also provide for modernization of relocated recreation facilities, including, at a minimum, modifications to comply with current standards of health and safety. The DEIS Chapter 18, "Recreation and Public Access," Section 18.3.4, "Direct and Indirect Effects," states the affected recreational facilities to be replaced would comply with current Americans with Disabilities Act (ADA) and Architectural Barriers Act (ABA) guidelines.

Recreation Relocation Plans Chapter 2, "Alternatives," Section 2.3.8, "Comprehensive Plan Construction Activities," describes that relocation plans were developed to verify that with any dam raise that existing recreational capacity could be maintained. Reclamation and USFS will continue to work together to develop and finalize plans for relocation of recreational facilities that are suitable for the National Recreation Area (NRA). At a minimum the current available capacities would be maintained and inundated and affected facilities would be relocated on-site to the extent practical. Chapter 2, "Alternatives", Section 2.3.8, "Comprehensive Plan Construction Activities," text has been revised to clarify that the preference is to maintain the marinas in the immediate vicinity of the existing facility, but due to unforeseen circumstances preventing this, the recreation capacity may be relocated or consolidated to other marinas. Recreation facility relocation would occur to coincide with the filling of the enlarged lake to minimize recreation facilities

outages. While there may be short periods of outages at a particular facility, these outages would be planned such that at least one or more of each type of facility would remain open at any one time. Mitigation Measure Rec-2 "Provide Information About and Improve Alternate Recreation Access and Opportunities to Mitigate the Temporary Loss of Recreation Access and Opportunities During Construction at Shasta Dam" would allow for notification to the public of outages during construction. Overall, short –term construction impacts are balanced against the long-term improvement in recreation opportunities to provide an increase in recreation opportunities at a cost of some disruption during constructing and filling of an enlarged Shasta Lake.

Recreation Facility Quality The DEIS Engineering Summary Appendix, Chapter 4, "Design Consideration for Reservoir Area Infrastructure Modifications and/or Relocations," states that Reclamation would seek to maintain the quality of the visitor experience by replacing affected facilities with similar visual elements, amenities and access to Shasta Lake. Facilities like trails would be relocated upslope out of the inundation pool.

Whiskeytown-Shasta Trinity National Recreation Area

Whiskeytown-Shasta-Trinity NRA Mitigation The action alternatives would result in a reduction of total land area in the Whiskeytown-Shasta-Trinity NRA. Mitigation for these adverse impacts are described in Chapter 19, "Land Use and Planning," Section 17.3.5, "Mitigation Measures." Mitigation Measure LU-2 "Minimize and/or Avoid Conflicts with Land Use Goals and Policies" addresses Impact LU-2 "Conflict with Existing Land Use Goals and Policies of Affected Jurisdictions." This mitigation measure focuses on relocating recreation facilities consistent with the STNF LRMP and NRA Management Guide, implementation of measures to minimize loss of use of USFS lands (including open space and Riparian Reserve allocations), and consideration of STNF LRMP, NRA Management Guide and pertinent county guidance. This could include the purchase of private lands within the Whiskeytown-Shasta-Trinity NRA.

REC-2 – Ground Surveys for Recreation Facilities

During the public comment period, several comments were received regarding the ground surveys that were performed in 2012 for privately owned structures that were potentially affected by the project. Commenters expressed their desire to have this same opportunity afforded to recreation structures located around Lake Shasta that may be affected. Comments received included requests to extrapolate surveys from completed parcels to adjoining and/or nearby parcels, to conduct additional ground surveys to structures on private property and land leased by permit issued by the USFS, and to provide clarity to why USFS permit holders were not included in the original surveys.

As described in the DEIS Real Estate Appendix under the "Structure Surveys" heading, the 2012 structure surveys were performed on 170 parcels for willing owners. Reclamation performed the surveys to evaluate and compare sensitivities of partial and full acquisitions to the estimated real estate impacts included in the Real Estate Appendix. This sensitivity analysis served to determine if the real estate impacts applied for the purposes of the DEIS are consistent among all structures. Survey results show that original determinations were generally within ± 5 percent. For cabins permitted on Federal lands by the USFS, please refer to Master Comment Response FSCABINS-9, "Structure Surveys for USFS Cabins."

REC-3 – Effects to Tourism at Shasta Lake

During the public comment period comments were received regarding the potential loss of tourism as a result of the Shasta Dam raise. Several commenters expressed concern that many of the recreation businesses would not be able to afford the cost of relocation. Commenters expressed concern of the temporary loss in tourist activities such as the Shasta Dam tours.

The DEIS states in Chapter 1, "Introduction," Section 1.5.3, "USFS Use of EIS," that USFS operated recreation facilities impacted by the increased inundation would be replaced or relocated by Reclamation. Chapter 2, "Alternatives," Section 2.3.1, "Management Measures Common to All Action Alternatives," specifies that all of the action alternatives include features to, at a minimum, maintain the overall recreation capacity of the existing facilities. As stated in the DEIS Engineering Summary Appendix, Chapter 4, "Design Consideration for Reservoir Area Infrastructure Modifications and/or Relocations," Reclamation would protect recreation facilities from inundation, modify existing facilities to replace affected areas, or abandon existing facilities and replace them at other suitable sites. Chapter 2, "Alternatives," Section 2.3.8, "Comprehensive Plan Construction Activities," also clarifies that affected recreation facilities would be relocated before any existing site is demolished to the extent practicable so that access for recreation can be maintained during construction and scheduling/sequencing of recreation facility relocation will strive to minimize or avoid interruption to public recreation activities and access to recreation sites. Chapter 18, "Recreation and Public Access," Section 18.3.4, "Direct and Indirect Effects," details the short-term and long-term effects of the no action and action alternatives on recreation and public access to lake recreation amenities, detailing which facilities would be difficult to reach during the construction period due to closure of access across the dam. The purpose of the EIS is to provide the information to the decision-makers and the public in order for an informed decision to be made concerning the overall benefits versus effects of the proposed action and alternatives.

In DEIS Chapter 18, "Recreation and Public Access," Section 18.3.5, "Mitigation Measures," describes Mitigation Measure Rec-2, "Provide Information About and Improve Alternate Recreation Access and Opportunities to Mitigate the Temporary Loss of Recreation Access and Opportunities During Construction at Shasta Dam," which states that to mitigate for the temporary disruption of the Shasta Dam tours Reclamation will provide enhanced information about the dam and operations at the visitors center. Reclamation plans to provide access to the visitor center throughout the construction period.

Also see Master Comment Response SOCIOECON-1, "Socioeconomic Effects to Shasta Lake Vicinity."

REC-4 – Relocation of Recreation Facilities

During the public comment period several comments were received that were concerned over the specifics of recreation facility relocations. Some concerns included who would pay for the engineering and construction of facility relocation, and what standards would be used for the design. As stated in the DEIS Chapter 2, "Alternatives," Section 2.3.8, "Comprehensive Plan Construction Activities," relocation plans were developed to verify for each action alternative, could the existing recreational capacity be maintained. Reclamation and USFS will continue to work together to develop and finalize plans for relocation of recreational facilities that is suitable for the NRA, should an alternative be authorized by Congress. At a minimum the current available capacities would be maintained, inundated and affected facilities would be relocated to the extent practicable. Chapter 2, "Alternatives," Section 2.3.8, "Comprehensive Plan Construction Activities," text has been revised to clarify that the preference is to maintain the marinas in the immediate vicinity, but due to unforeseen circumstances preventing this, the capacity may be relocated or consolidated to other marinas.

The DEIS states in Chapter 1, "Introduction," Section 1.5.3, "USFS Use of EIS," that USFS operated recreation facilities impacted by the increased inundation would be replaced or relocated by Reclamation. As stated in the DEIS Engineering Summary Appendix, Chapter 4, "Design Consideration for Reservoir Area Infrastructure Modifications and/or Relocations," Reclamation would protect recreation facilities from inundation, modify existing facilities to replace affected areas, or abandon existing facilities and replace them at other suitable sites. The DEIS Chapter 2, "Alternatives," Section 2.3.8, "Comprehensive Plan Construction Activities," also clarifies that affected recreation facilities would be relocated before any existing site is demolished to the extent practicable so that access for recreation can be maintained during construction. As stated in the DEIS Engineering Summary Appendix Chapter 4, "Design Considerations for Reservoir Area Infrastructure Modifications and/or Relocations," section on "Marians/Boat Ramps

Modifications," all seven affected public boat ramps would be modified to maintain lake access during the times the lake is at full pool.

The DEIS Chapter 18, "Recreation and Public Access," Section 18.3.4, "Direct and Indirect Effects," Impact Rec-1 (CP1 through CP5) describes that the affected recreational facilities to be replaced would be modernized and would comply with current ADA and ABA guidelines.

REC-5 – Relocation of Private Recreation Facilities onto Federal Lands

During the public comment period, comments were received concerning the lack of details regarding affected cabins located on private lands. These comments ask specific questions about why these cabins are not identified to be relocated, and afforded some of the same rights and opportunities available to the USFS permit holders.

Neither the USFS nor Reclamation has the authority to gift, or transfer lands held by the federal government to private owners. As stated in Chapter 2, "Alternatives," Section 2.3.2, "Environmental Commitments Common to All Action Alternatives," the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (49 CFR 24), will be followed in property acquisition. For further information please refer to Master Comment Response PLAR-1, "Effects on Private Residences and Businesses."

The USFS is responsible for the Whiskeytown-Shasta Trinity NRA, and manages the NRA according to the Shasta-Trinity National Recreation Area Management Guide (1996). This guide addresses key management concerns related to recreation and other resource management, such as type and amounts of commercial and USFS recreation facilities to be provided on National Forest System lands.

REC-9 – Relationship Between Recreation and Shasta Lake Water Levels

During the public comment period, comments were received that expressed concern that currently the lake level is not managed effectively for recreation.

As stated in the DEIS Chapter 1, "Introduction," Shasta Dam was built to provide floodwater management, irrigation water supply, municipal and industrial water, hydropower generation, maintenance of navigable flows, and was amended by CVPIA to include fish and wildlife mitigation, protection and restoration as well as fish and wildlife enhancement. Recreation was not an authorized public purpose of the Shasta Division of the CVP and no recreation facilities were established as part of the original project.

As stated in the DEIS Chapter 18, "Recreation and Public Access," Section 18.1.1, "Recreation," that the dam is primarily operated for water supply, while meeting environmental and regulatory requirements, which results in annual cycles of the water level which varies by hydrologic year type. The reservoir reaches its highest level in the late spring and will be gradually drawn down through the summer peak recreation period.

The DEIS Chapter 6, "Hydrology, Hydraulics, and Water Management," Section 6.3.3, "Direct and Indirect Effects," Table 6-5 shows the end of month average storage for the existing and future conditions, the table also displays the change in that average modeled for each alternative. The results show an increase in storage for each action alternative in both the existing and future conditions.

The DEIS Chapter 18, "Recreation and Public Access," Section 18.3.4, "Direct and Indirect Effects," Table 18-5 shows the percent exceedance of the of Shasta Lake public boat ramp availability that were simulated using CalSim-II modeling results. The results show that with the dam raise the current minimum ramp elevations will be exceeded for a longer period during the recreational season of May through September. These results support the conclusion that an increase in recreation access to Shasta Lake would occur under all action alternatives. Similar improvements for boat ramps at marinas would also be expected.

33.3.25 Master Comment Responses for Private Land Acquisition/Relocation

PLAR-1 – Effects to Private Residences and Businesses

Several comments were received associated with effects on businesses and homes if Shasta Reservoir is enlarged. Common topics among these comments are the loss of private property, relocation of private property, acquisition with willing sellers, acquisition through eminent domain, property appraisals, capital gains taxes, and real property disclosure.

Each of these topics are associated and addressed by the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (Uniform Act) (49 CFR 24), as stated in DEIS Chapter 2, "Alternatives," Section 2.3.2, "Environmental Commitments Common to All Action Alternatives." Application of the Uniform Act would occur following Congressional authorization of the project. Special acquisition rules can be supplemented to the Uniform Act specific to the project as part of Congressional authorization of the project. Although including property acquisition information is not required under NEPA, this Master Comment Response provides background on provisions of the Uniform Act and is provided for informational purposes only to respond to comments on this subject.

Property Appraisals and Related Processes To provide an independent and unbiased valuation of businesses and homes, Reclamation contracts its appraisal services to the U.S. Department of the Interior, Office of Valuation Service (OVS), an entity codified by Departmental Manual Chapter 112 DM 33 effective June 1, 2011. The OVS supports the overall mission of the Department of the Interior as the independent body to evaluate whether land acquisitions and dispositions are at market values, as required by law and regulation. It is responsible for all real property valuation functions, including contributory values for minerals, timber, water, and other property rights as appropriate for the Department of the Interior's four main bureaus: BLM, Reclamation, USFWS, and National Park Service. The OVS predominantly subcontracts appraisal services to a certified real property appraiser, whose work is reviewed by the OVS to ensure compliance with the Uniform Standards of Professional Appraisal Practice as well as the Uniform Appraisal Standards for Federal Land Acquisition.

This appraiser provides her or his professional opinion of a property's current market value following an inspection of the property and preparation of a report. Landowners have the right to accompany the appraiser during her or his inspection of the property and provide additional relevant information. Market value is typically defined as that amount of money which would probably be paid for a property in a sale between a willing seller and a willing buyer. The market value does not take into account intangible elements such as sentimental value, good will, or any special value the property may have to the owner/tenant or the buyer. In accordance with the Uniform Appraisal Standards for Federal Land Acquisitions, no enhancement or decrease in value attributable to the project is to be considered in estimating market value. Each parcel of real property is independently assessed then value is estimated based on many factors that can include:

- How it compares to similar properties in the area that have been sold recently.

- If it is a business, the income and expenses will be evaluated. How much it would cost to reproduce the buildings and other structures, less any depreciation.

This appraisal is reviewed for consistency with established industry standards by OVS and becomes the basis for the "just compensation" offered for the property. "Just compensation" for your property does not take into account your relocation needs. Relocation is a separate issue from property acquisition and will be addressed in accordance with the Uniform Act.

Owners of real property are not obligated to accept the agency's offer. The owner is entitled to present evidence, in the form of an independent appraisal obtained by the seller that conforms to the Uniform Appraisal Standards for Federal Land Acquisitions. At that point, negotiations will begin. Although Reclamation has some flexibility regarding purchase price, if an agreement cannot be reached, Reclamation reserves its right to begin eminent domain proceedings. The first step in eminent domain procedure is for Reclamation to file a Declaration of Taking, in which the OVS appraised value is deposited with the federal court and the property becomes titled in the United States. The subsequent court proceedings involve a review by a federal judge to determine if the appraised value was proper or if additional monies should be paid to the seller. In the event of eminent domain, all rights of the seller under the Relocation Act remain intact.

Capital Gains Internal Revenue Service (IRS) Publication 544 explains how the Federal income tax would apply to a gain or loss resulting from the sale or condemnation of a real property, or its sale under the threat of condemnation, for public purposes. Specific questions about IRS rules should be discussed for your particular circumstances with your personal tax advisor or your local IRS office.

Relocation The Uniform Act provides Reclamation the guidance for relocation rules, including replacement property that is functionally equivalent to the seller's current property. Functional equivalency is explained in 49 CFR 24, Subpart A. The exchange of private property for lands held by the Federal government can only be made through Congressional action during project authorization.

Real Property Disclosure California rules for disclosures in real property transactions are published by the State of California Department of Real Estate in California Civil Code (commencing at Section 1102). These Real Estate Transfer Disclosure Statements obligate real estate agents and sellers to make disclosures necessary to avoid fraud, misrepresentation or deceit. Under State disclosure rules, real estate agents or sellers are not required to disclose the conduct of a Federal feasibility study because, in part, it is an activity that may or may not lead to actual implementation. If, however, the project is authorized by Congress, Reclamation will coordinate with local jurisdictions to compile a list of parcels that are in an inundation area and post at offices of the county recorder, county assessor, and county planning agency consistent with California Government Code Section 8589.4.

PLAR-9 – Maps and Additional Surveys of Private Parcels/Structures

Comments were received relating to foundation surveys performed on private property as part of a sensitivity analysis of real estate effects estimated for the project. Comment requests included availability to repeat the surveys or extrapolate survey data to other parcels.

As described in the DEIS Real Estate Appendix, Reclamation performed structural surveys on 170 parcels for willing landowners in the Lakehead community. No properties with permanent structures were surveyed without written permission by the landowner. Due to the sensitivity of the information, a customized map displaying parcel-specific elevation data was provided to each landowner who authorized the surveys. These surveys were used to compare sensitivities of partial and full acquisitions of property to estimate real estate impacts. Data collected from these surveys are not applicable to other parcels in the area without subsequent foundation surveys by a qualified surveyor. This sensitivity analysis served to determine if the real estate impacts applied for the purposes of the DEIS are consistent among all structures. Survey results show that original determinations were generally within ± 5 percent. As the sensitivity analysis demonstrated an acceptable range applicable to structures potentially inundated by the project, Reclamation does not intend to perform additional structure surveys on private property before Congressional authorization. Should Congress authorize a project, and a ROD be developed and issued, additional field surveys would be performed throughout the project area to define site-specific effects.

PLAR-11 – Inundation Zone/Reservoir Buffer

Several comments were received relating to reservoir pool elevations applied to the project and its associated buffer area.

The DEIS Real Estate Appendix, identified Reservoir pool elevations of 1,082, 1,088 and 1,093 feet North American Vertical Datum (NAVD) to correspond to alternative dam raises of 6.5 feet, 12.5 feet, and 18.5 feet, respectively. These figures and datum serve as the basis for the DEIS and replace figures provided during earlier planning phases. These estimates are included in a variety of sections and tables in the Real Estate Appendix, including “Background and Approach,” “Methods for Cost Estimate of Real Estate Acquisition Administration,” and “Privately Owned Cabins on U.S. Forest Service Lands” (See Table 1. Range of Impacted Cabins on U.S. Forest Service Lands). As described in the “Background and Approach” section, these pool elevations approximate a 3-foot vertical buffer area above the inundation level or a 5-foot horizontal buffer area extending from the inundation level, whichever buffer is greater. For the purposes of estimating physical effects of inundation and associated project costs for this EIS, this buffer area represents an extent by which lands would be acquired via the

project consistent with the policy for the Department of Interior and USACE and is published in 43 CFR Part 8, "Joint Policies of the Departments of the Interior and of the Army Relative to Reservoir Project Lands." This joint policy provides, among other things, guidance for fee title acquisition of lands necessary for permanent structures, lands below a selected freeboard, and to provide public access to the maximum flowage line or for operation and maintenance of the project. Additional clarifying text was incorporated into the Real Estate Appendix to clarify that the buffer area estimates potential wave action and related freeboard considerations.

33.3.26 Master Comment Responses for USFS Cabins

FSCABINS-1 – USFS Recreational Residence Tract Cabins in Preliminary Draft EIS and Draft EIS

Several individuals provided comments relating to Recreational Residence Tract cabins located on parcels permitted by the USFS. Commenters questioned the level of detail/clarity and associated outreach related to these structures as contained in the Preliminary Draft EIS (February 2012) and the DEIS.

As cited in the November 2011 Summary of the Preliminary Draft EIS (page S-2), the Preliminary Draft EIS presented findings to date and was released to the public to provide additional opportunity for public and stakeholder input. The Preliminary Draft EIS is inherently less complete than the July 2013 DEIS. Content provided in the DEIS is sufficient for evaluation under NEPA guidelines and to provide informed decision-making. Specific relocation requirements would be determined if and when a project is authorized by Congress for implementation.

Consistent with prior public outreach activities, Recreational Residential Tract Cabin Owners will be included with other public and stakeholder entities for future notifications and outreach associated with the Final EIS. This process was described in DEIS Chapter 27, "Public Involvement, Consultation, and Coordination," Section 27.6, "DEIS Outreach."

FSCABINS-2 – USFS's Authority over Privately Owned Cabins on USFS Lands

Comments were received concerning the role and decision-making process of the USFS in the DEIS and USFS's authority over privately owned cabins on USFS permitted lands.

DEIS Chapter 1, "Introduction," Section1.5.3, "USFS Use of EIS," describes the USFS purpose and need, proposed USFS permitting actions, and related actions that may be required if a project is authorized for construction. Specifically, the USFS would have a

connected action to amend the affected permits for privately operated recreation facilities, including permitted private cabins on USFS lands.

As referenced in Chapter 18, "Recreation and Public Access," USFS has reviewed the preliminary assessments of impacts on public and commercial recreation facilities. As managers of land adjacent to Shasta Lake, the USFS has been involved as a cooperating agency throughout the EIS process and has provided comments during the public comment period. As the federal lead agency, Reclamation will continue to work with USFS if and when a project is authorized by Congress for implementation.

Regarding residential cabins permitted on USFS land, as quoted in page 5 of the Real Estate Appendix (June 2013) of the DEIS, special use permit terms apply to permit holders:

> *"If during the term of this permit the authorized officer determines that specific and compelling reasons in the public interest require revocation of this permit, this permit shall be revoked after 180 days written notice to the holder, provided that the authorized officer may prescribe a shorter notice period if justified by the public interest. The USFS shall then have the right to relocate the holder's improvements to another lot, to remove them, or to require the holder to relocate or remove them, and the USFS shall be obligated to pay an equitable amount for the improvements or for their relocation and damages resulting from their relocation that are caused by the USFS."*

Reclamation is not involved in the terms of the USFS special use permits for the privately owned cabins on USFS lands. Actions taken by the USFS with regards to special use permit is described in DEIS Chapter 1, "Introduction," Section1.5.3, "USFS Use of EIS." Such USFS decisions would occur following authorization by Congress to proceed with implementation of one of the action alternatives.

FSCABINS-3 – Relocation of Privately Owned Cabins on USFS Lands

Comments were received regarding the potential for owners of privately owned cabins subject to USFS permit conditions to receive another lot on USFS land in the event a private cabin is removed if enlargement of Shasta Reservoir is authorized.

As stated in DEIS Chapter 2, "Alternatives," Section 2.3.2, "Environmental Commitments Common to All Action Alternatives," Reclamation will comply with the policies and provisions for the

acquisition of real property set forth in the Uniform Relocation Assistance and Real Property Act of 1970, as amended. However, specific to privately owned cabins on USFS lands, permit holders are also subject to USFS availability for permitted lots and USFS decisions. As stated on page 5 of the Real Estate Appendix (June 2013) of the DEIS, USFS is guided by the following special permit terms:

> *"If during the term of this permit the authorized officer determines that specific and compelling reasons in the public interest require revocation of this permit, this permit shall be revoked after 180 days written notice to the holder, provided that the authorized officer may prescribe a shorter notice period if justified by the public interest. The USFS shall then have the right to relocate the holder's improvements to another lot, to remove them, or to require the holder to relocate or remove them, and the USFS shall be obligated to pay an equitable amount for the improvements or for their relocation and damages resulting from their relocation that are caused by the USFS."*

FSCABINS-5 – Comment and Objection Process for Draft USFS Decisions

Several individuals stating ownership of a private cabin on lots permitted by the USFS provided comments related to establishment of their eligibility to file an objection to draft USFS decisions as they relate to the SLWRI.

These comments are consistent with the "Comment and Objection Process for Draft Forest Service Decisions," a one page letter provided to Reclamation by USFS staff and attached by Reclamation to its June 25, 2013, letter announcing the Public Review and Comment on the DEIS for SLWRI. The USFS requested inclusion of this letter (contained below) as an element to Chapter 1, "Introduction," Section 1.5.3, "USFS Use of EIS." This section, among other elements, describes USFS jurisdiction over National Forest System lands within the NRA and their permit obligations under the Federal Land Policy and Management Act (43 U.S. Code Section 1761 (a)(1)). These comments have been made available to USFS. The comment will be included as part of the record and made available to decision makers before a final decision on the proposed project.

> *COMMENT AND OBJECTION PROCESS FOR DRAFT FOREST SERVICE DECISIONS*
>
> *The Forest Service is required to provide for a predecisional comment and objection process, and to*

notify concerned persons of the requirement to comment on the Draft EIS related to Forest Service actions in order to object to future draft Forest Service decisions.

Only those who submit timely project-specific, written comments no later than 90 days after the Notice of Availability appears in the Federal Register are eligible to file an objection to draft Forest Service decisions. Individuals or representatives of an entity submitting comments must sign the comments or verify their identity upon request.

To establish eligibility to object, comments must include the following:

Name and postal address. E-mail address in addition is recommended but not required.

Title of the proposed project or activity.

Specific written comments regarding the Forest Service proposed project or activity along with supporting reasons.

Signature or other verification of identity upon request, and identification of the individual or entity who authored the comment(s). Comments received on behalf of an entity are considered as those of the entity only.

The responsible Federal officials will consider all written comments submitted. It is the responsibility of the commenter to ensure their written comments to establish eligibility to object to Forest Service decisions are received in a timely manner and include the required information.

For more information on the Forest Service Project-Level Pre-decisional Administrative Review Process, please go to http://www.fs.fed.us/emc/applit/includes/20130327_218FinalRuleFedReg.pdf. For additional information on Forest Service actions associated with the Bureau of Reclamation Draft EIS, contact Mr. Nathan Rezeau at 530-275-1587 or nrezeau@fs.fed.us.

FSCABINS-8 – Inundation Zone/Reservoir Buffer

Several comments were received relating to reservoir pool elevations applied to the project and its associated buffer area.

The DEIS Real Estate Appendix, Reservoir identified pool elevations of 1,082, 1,088 and 1,093 feet NAVD to correspond to alternative dam raises of 6.5 feet, 12.5 feet, and 18.5 feet, respectively. These figures and datum serve as the basis for the DEIS and replace figures provided during earlier planning phases. These estimates are included in a variety of sections and tables in the Real Estate Appendix, including "Background and Approach" (Page 1), "Methods for Cost Estimate of Real Estate Acquisition Administration" (Page 4), and "Privately Owned Cabins on U.S. Forest Service Lands" (See Table 1. Range of Impacted Cabins on U.S. Forest Service Lands). As described in the "Background and Approach" section, these pool elevations approximate a 3-foot vertical buffer area above the inundation level or a 5-foot horizontal buffer area extending from the inundation level, whichever buffer is greater. For the purposes of estimating physical effects of inundation and associated project costs for this EIS, this buffer area represents an extent by which lands would be acquired via the project consistent with the policy for the Department of Interior and USACE and is published in 43 CFR Part 8, "Joint Policies of the Departments of the Interior and of the Army Relative to Reservoir Project Lands." This joint policy provides, among other things, guidance for fee title acquisition of lands necessary for permanent structures, lands below a selected freeboard, and to provide public access to the maximum flowage line or for operation and maintenance of the project. Additional clarifying text was incorporated into the Real Estate Appendix to clarify that the buffer area estimates potential wave action and related freeboard considerations.

FSCABINS-9 – Structure Surveys for USFS Cabins

Several comments were received relating to reservoir pool elevations applied to the project and its associated buffer area and whether additional surveys will be conducted. Several individuals, and a representative of the USFS, requested Reclamation conduct structure surveys of potentially effected Recreational Residence Tract cabins located on USFS land via special use permit. These requests seek to have Reclamation perform structure surveys to a level similar to those conducted in 2012 on 170 private property parcels in the Lakehead community.

As described in the Real Estate Appendix (June 2013, Page 7), Reclamation performed structural surveys on 170 parcels for willing landowners in the Lakehead community. The primary intent of these surveys was to verify the accuracy of Geographic Information System (GIS) analyses used to estimate the number of structures potentially affected by the project. The surveys showed that the GIS estimates of the number of structures potentially affected by the project, and disclosed in the Real Estate Appendix, were generally accurate within ±5 percent. As the surveys confirmed an acceptable range of accuracy, Reclamation does not intend to perform additional structure surveys on

private property at this time. Should Congress authorize a project and a ROD be developed and issued, a more in-depth analysis would be performed.

33.3.27 Master Comment Responses for Land Use

LANDUSE-1 – Relocation of Septic Systems and Leach Fields

As stated in the DEIS, Chapter 21, "Utilities and Service Systems," Section 21.3.4, "Direct and Indirect Effects," septic systems in the project area are governed by Shasta County Development Standards, including intermittent inundation of septic systems and requirements to protect water quality in surface and subsurface water supplies from contamination by septic systems. Consistent with these standards, all septic system within 200 feet of the new full pool waterline or 100 feet downslope of the new full pool waterline would be demolished. Wastewater pipes, septic tanks, vaults/pits, and leach fields would be abandoned in place consistent with requirements of the County of Shasta Environmental Health Division. New septic systems may be constructed on the same property if they would meet Shasta County requirements for separating septic systems from the lake. Relocation of septic systems on private property would be done in one of two ways: (1) construct new septic systems on the property of the affected home or facility, where feasible; or (2) define a possible localized waste water treatment plant (WWTP) alternative for homes that do not meet Shasta County requirements for septic system separation from the lake. The general WWTP would include a pressurized sewer collection system to transport wastewater flows to several centralized package WWTPs. The DEIS Chapter 2, "Alternatives," identifies the likely construction of localized WWTPs for the areas of Salt Creek, Sugarloaf/Tsasdi Resort, Lakeshore (possibly several plants), Antlers Campground, Campbell Creek Cove, Bridge Bay Marina, Silverthorn Resort, and Jones Valley. Additional localized WWTPs for cabins on land held in USFS Special Use Permit will be evaluated following Congressional authorization of an action alternative, ROD and subject to USFS permit terms and conditions. Chapter 21, "Utilities and Service Systems," Section 21.3.4, "Direct and Indirect Effects," also states that Reclamation is committed to funding these activities and coordinating the transfer of any new WWTPs to the districts, which would be responsible for long-term operation and management.

33.3.28 Master Comment Responses for Utility Relocations

UR-1 – Effects to Water and Wastewater Infrastructure around Shasta Lake

Comments received during the public comment period expressed concern over some of the local water companies and some of the effects caused by the loss of their customer base, inundation of their

infrastructure, and some of the possible costs they could incur because of relocations. Considerations for the local utilities and water service providers include the following.

Relocation of Affected Infrastructure The DEIS Chapter 2, "Alternatives," Section 2.3.8, "Comprehensive Plan Construction Activities," states that gas/petroleum, potable water, power and communication, and wastewater facilities would be relocated to comply with current standards if affected by inundation. This also includes water supply intakes located around the lake and wells that serve existing and/or relocated structures. During relocation, commitments have been made to minimize impacts on water quality from construction activities. As stated in Chapter 2, "Alternatives," Section 2.3.2, "Environmental Commitments Common to All Action Alternatives," all action alternatives include development and implementation of an Erosion Control and Sediment Plan and Stormwater Pollution Prevention Plan. Text in the Final EIS has been revised to clarify the impacts to water quality in Chapter 7, "Water Quality," Section 7.3.4, "Direct and Indirect Effects," including Impact WQ-1, "Temporary Construction-Related Sediment Effects on Shasta Lake and its Tributaries that Would Cause Violations of Water Quality Standards or Adversely Affect Beneficial Uses," and Impact WQ-4, "Long-Term Sediment Effects that Would Cause Violations of Water Quality Standards or Adversely Affect Beneficial Uses in Shasta Lake or Its Tributaries." There is no anticipated affect to the water quality or infrastructure of utilities downstream from Shasta Dam as a result of the project.

Cost of Relocations DEIS Chapter 21, "Utilities and Service Systems," Section 21.3.4, "Direct and Indirect Effects," states that "Reclamation is committed to funding and relocation of existing infrastructure and construction of replacement infrastructure, including localized WWTPs that might replace some individual septic systems." The costs for relocations of utilities and the proposed waste water collection systems have been included in the cost estimates for all action alternatives and can be found in Attachments 2,3, and 4 of the Engineering Summary Appendix of the Final EIS for each action alternative. As stated in DEIS Chapter 2, "Alternatives," Section 2.3.8, "Comprehensive Plan Construction Activities," that inundated recreation facilities and associated facilities will be relocated before demolition to the extent practicable. Further development of specific planning, design and construction methods for the relocated infrastructure will occur after congressional authorization of any action alternative, and will follow all guidelines, requirements, and standards for similar facilities.

Local Water Service Providers The number of landowners within each water service area that would be affected varies by the action alternative. Reclamation has not performed an evaluation to determine

whether changes due to the implementation of the action alternatives would make a substantial change in local water service provider's budgets to the extent of potential insolvency. As discussed above Reclamation will relocate affected water services to maintain service to non-inundated structures at no cost to landowners as Reclamation will fund these relocation actions. These actions will prevent loss of customers that remain after lake enlargement, however, a net loss of water service area landowners may occur due to inundation which could affect the financial ability of water service providers to repay loans without raising rates for their customers.

33.3.29 Master Comment Responses for Downstream Fisheries

DSFISH-1 – SALMOD Model for Sacramento River Chinook Salmon

Comments were received related to SALMOD not being considered the most appropriate available tool, and the need to more fully disclose in the Final EIS the inherent uncertainties in the use of the SALMOD tool.

Analyses and impact assessment presented in the DEIS were completed using the best modeling tools and information available at the time of development. The modeling tools used in the DEIS analyses were selected because they are publicly available, have a knowledgeable user community, and are widely accepted for use in similar system wide analysis of resources in the California Central Valley and the Trinity River. Similarly, SALMOD has been one of the primary tools used to evaluate salmonid responses to revised water operations in the upper Sacramento River, including the most recent 2008 Long-Term Operation BA and resulting 2008 USFWS BO and 2009 NMFS BO.

SALMOD uses as its base data the real empirical data on Chinook salmon distribution and habitat use collected by the USFWS and CDFW in the Sacramento River. SALMOD was set up based on USFWS Instream Flow Incremental Methodology (IFIM) data, with direct input from both USFWS and CDFW (i.e., Mark Gard, Doug Killam), as well as incorporating comments from CDFW, USFWS, and Reclamation fisheries experts before completing the model structure. The model has been peer reviewed, including by Lisa Thompson and Chris Mosser of U.C. Davis (2011).

SALMOD is not used as a population dynamics model or a predictive tool for explicit population estimation, rather it is used as an operations and alternatives screening tool, or a comparative tool to evaluate relative change between alternatives. It is being used on a year-by-year basis, which allows Reclamation, under each year, to evaluate what would happen under the water operations, to each run of Chinook salmon (NMFS used late fall-run Chinook salmon as a surrogate for steelhead in the 2009 NMFS BO). By using the same annual number of spawners,

Reclamation is able to make a true comparison using each alternative against the base condition (existing or future condition). The described limitations do not preclude the ability of SALMOD to identify potential effects to Chinook salmon caused by changes in Shasta operations.

SALMOD, like any model of a natural system, is based on simplified rules and assumptions used to represent and approximate the complex factors that drive real-world conditions; while these assumptions can form a reasonably accurate and useful simulation of natural conditions, they cannot exactly replicate or predict actual conditions. Similarly, because it is not possible to fully understand or quantify all of the variability found in natural systems, and the complex interactions between different components of those systems, there are inherent uncertainties associated with the assumptions in all fisheries model including SALMOD. These required simplifications and inherent uncertainties in model inputs naturally lead to uncertainties in the accuracy of model outputs for any individual model run relative to actual, real-world conditions.

Some of the factors outside of the area of influence of the SLWRI (for instance, ocean conditions) are poorly understood and are themselves subject of both environmental and anthropogenic forces, making them highly uncertain and thus difficult to quantify or even fully anticipate. Ultimately, because SLWRI is only able to improve specific portions of the life cycle of anadromous fish, within a specific section of the Sacramento River, which have been demonstrated to be likely limiting factors to anadromous fish survival, any other portions of the life cycle that may also be limiting factors for anadromous fish survival will have to be addressed by other actions/projects that are outside the purview of the SLWRI. Inclusion of those factors outside of the areas and life stages influenced by this project could obscure the modeling effort and as such, the influence of the project, by introducing significant uncertainty from factors (and life stages) that are not directly influenced by the project. Therefore, the model has been formulated to isolate the effect of the project on anadromous fish survival.

In addition, SALMOD relies on output from a sequence of other models (CalSim-II and Sacramento River Water Quality Model (SRWQM)) for its flow and water temperature inputs. These models contain similar simplifications and uncertainties, which further influence the overall accuracy of a single SALMOD model run (as would occur with any ecological model using the same tools for input). For instance, CalSim-II, the best available tool for predicting system-wide water operations throughout the Central Valley, simplifies the system by assessing flows on a monthly basis and at a relatively coarse geographic scale, while fish populations are affected by changes on much finer temporal and

geographic scales, so flows must be downscaled using an additional set of assumptions to approximate natural processes.

For purposes of evaluating the potential effect of changes in Sacramento River flow and temperature on Chinook Salmon populations between Keswick Dam and Red Bluff Pumping Plant, it was assumed that simulated changes in average annual production that were less than 5 percent (plus or minus) relative to the basis-of-comparison (No-Action Alternative and Existing Conditions) would not be expected to result in a significant (detectable) effect on long term Chinook Salmon production potential. The 5 percent significance threshold accounts for the inherent limitations and uncertainties associated with SALMOD, as well as the limitations and uncertainties in the hydrologic model (CalSim-II) and temperature model (Sacramento River water temperature model) used to develop inputs to SALMOD. This is further described in both Chapter 11, "Fisheries and Aquatic Ecosystems," of the DEIS and Chapter 5, "SALMOD," of the Modeling Appendix.

However, with sufficient data, models like SALMOD are invaluable tools for understanding the operation of a complex system and predicting its response to certain types of change. If the modeling assumptions and parameters form reasonably accurate representations of the relationships between input variables and outputs, and the nature of those relationships do not change between scenarios, then the model is valid to use for comparing between alternatives despite its inherent uncertainty (identical assumptions will influence all scenarios and lead to similar uncertainties/ inaccuracies that cancel out in the process of comparison). The simulated production from SALMOD should therefore be interpreted as an index of production which can be used to make comparisons between alternatives, and should not be treated as a prediction of absolute numbers of fish production under any single alternative.

SALMOD is currently the best available tool for predicting project-related outcomes (on a relative, not absolute, basis) for all four Chinook salmon runs in the upper Sacramento River, and Reclamation believes that the assumptions applied in the SALMOD model are sound and defensible. Therefore, despite its acknowledged inherent limitations, Reclamation continues to believe that, when correctly interpreted, the use of SALMOD is a valid and valuable method for assessing project alternatives. Mortality calculations in SALMOD may be underestimated due to the difficulty in quantifying resource competition, predation and other natural factors, but may also be overestimated for some life stages. Please keep in mind that SALMOD was used for the purpose of comparing the proposed action alternatives, and was not intended to produce exact numbers, or to estimate survival of successful outmigrants

through the Delta or returning adults. SALMOD underestimates mortality both under the No-Action and action alternatives.

The Final EIS Executive Summary Chapter 11, "Fisheries and Aquatic Ecosystems," and the Modeling Appendix Chapter 5, "Anadromous Fish Production Simulation (SALMOD)," have been modified to clarify uncertainties of SALMOD.

DSFISH-2 – Fisheries Models and Tools

Comments suggest that there are other more appropriate modeling tools that could be used other than SALMOD, although not all commenters agreed upon the appropriate tools, nor did commenters supply evidence that other tools are widely accepted by regulatory agencies and the public.

Reclamation fully recognizes that there are many factors in addition to upper Sacramento River flow and temperature conditions that influence anadromous fish survival – including conditions in the lower Sacramento River, the Bay-Delta, and the Pacific Ocean – such as disease, predation, entrainment, habitat loss, and changes in flow and temperature regimes. However, no single action can simultaneously address the full range of limiting factors in all locations. As such, the SLWRI and its associated restoration actions should be viewed as only one among several required steps needed to address anadromous fish survival across all life stages.

Some of the factors outside of the area of influence of the SLWRI (for instance, ocean conditions) are poorly understood and are themselves subject of both environmental and anthropogenic forces, making them highly uncertain and thus difficult to quantify or even fully anticipate. Ultimately, because SLWRI is only able to improve specific portions of the life cycle of anadromous fish, within a specific section of the Sacramento River, which have been demonstrated to be likely limiting factors to anadromous fish survival, any other portions of the life cycle that may also be limiting factors for anadromous fish survival will have to be addressed by other actions/projects that are outside the purview of the SLWRI. Inclusion of those factors outside of the areas and life stages influenced by this project could obscure the modeling effort and as such, the influence of the project, by introducing significant uncertainty from factors (and life stages) that are not directly influenced by the project. Therefore, the model has been formulated to isolate the effect of the project on anadromous fish survival, by excluding factors outside of the area of influence of the project.

No fully vetted and accepted Chinook salmon life cycle model was available for use at the time the NEPA evaluation for the DEIS was conducted. While the Interactive Object-oriented Salmon (IOS) model

for winter-run Chinook salmon was used in the 2008 Long-Term Operation BA, it was considered an unacceptable and flawed tool by NMFS. The tool has since been updated and revised for BDCP, but there is no proof, as of yet, that it is considered by NMFS or other fisheries experts to be a reliable and acceptable model. Reclamation is currently funding NMFS to develop a Chinook salmon life cycle model, focusing initially on winter-run Chinook salmon, but it is still a work in progress. Therefore, Reclamation used SALMOD as an accepted tool in its evaluation of the SLWRI. It is unknown whether NMFS may request the use of a life cycle model for Section 7 consultation. In addition, tools such as IOS and the Oncorhynchus Bayesian Analysis model (OBAN), while publicly available, do not necessarily have a large user-base with access to, or working knowledge of, the required software and tools. Therefore, they are not considered 'available', and therefore Reclamation is not required to use these models in the NEPA analysis.

Several groups, including The Nature Conservancy and the USFWS, have suggested using the Sacramento River Ecological Flows Tool (SacEFT) to evaluate the effects of the project on riparian species. However, SacEFT is not a commonly applied and readily available tool for water resources planning studies in California. Unlike other commonly applied models and tools (for example CalSim-II, DSM2, and SALMOD), the full suite of tools needed to apply SacEFT (including supporting sub-models, such as the Meander Migration Model) are not readily available to the public, and do not have a large and diverse user-base with access to — and working technical knowledge of — the required software and tools. The Meander Migration Model does not appear to be a publicly available model, and Reclamation has been unable to obtain a conclusive answer about the availability of the complete suite of tools needed to apply SacEFT. Reclamation is not required by NEPA or CEQ Regulations to use tools which are not publicly available when conducting a NEPA evaluation.

Additionally, USFWS indicates that CalSim-II is not suitable for use in a fisheries analysis because it is a monthly model. However, no other tool is available that can simulate CVP/SWP operations on a daily basis. Both USFWS and NMFS used CalSim-II to generate the hydrology and operations data that was input to all fisheries models used in analyses for the 2008 USFWS BO and 2009 NMFS BO. The courts did not consider CalSim-II to be an inappropriate or invalid tool for those analyses, and found that there are no other widely accepted and verified tools currently available to simulate systemwide water operations. CalSim-II is the best tool currently available.

DSFISH-3 – Fish Habitat Restoration

Chapter 2, "Alternatives," Section 2.3, "Action Alternatives," describes the environmental commitments common to all actions alternatives as

well as measures specific to each of the action alternatives. Different components/measures were incorporated into each action alternative based on the focus of the action alternative. CP4 and CP4A focus primarily on anadromous fish survival, and CP5 focuses more broadly on both the primary and secondary objectives. Accordingly, based on the focus of these alternatives, augmenting spawning gravel and restoring riparian, floodplain, and side channel habitat in the upper Sacramento River were included only in CP4 and CP5.

The proposed spawning gravel augmentation program for the SLWRI would consist of gravel placement at one to three locations every year in the upper Sacramento River, for a period of 10 years. Fifteen potential locations have been identified in the Sacramento River between Keswick Dam and Shea Island for spawning gravel augmentation, and each site would be eligible for gravel placement one or more times during the 10-year program.

The proposed spawning gravel augmentation program is not a mitigation program, but is a restoration action that is not intended to be implemented in perpetuity. This program is intended to provide additional benefits to anadromous fish and is expected to 'kick-start' the process towards recovery in conjunction with flow and water temperature benefits in the spawning reach above Red Bluff Pumping Plant. Consistent with NEPA and other Federal water resources plan guidance (e.g., P&G), potential project impacts are evaluated in comparison to the No-Action Alternative, which is based on existing conditions and reasonably foreseeable future projects. The existing condition for the SLWRI includes the presence of Shasta Dam and action alternatives would not result in any additional blockage of spawning gravel.

The CVPIA program provides funding and water supplies for fish and wildlife protection, restoration, and mitigation for the CVP and includes a spawning and rearing habitat restoration program that implements gravel augmentation and juvenile salmonid rearing habitat improvements to compensate for the blockage of spawning gravel and other actions that have reduced the availability of spawning gravel and rearing habitat. Currently the program is in the environmental analysis process for eight spawning and rearing habitat improvement sites in the 14-mile reach below Keswick Dam. Three of the sites focus solely on gravel placement, four sites include both side channel habitat improvements and gravel placement, and one site focuses on side channel habitat development. The CVPIA will continue with or without the implementation of a SLWRI action alternative.

As with the gravel augmentation program, the riparian, floodplain and side channel habitat restoration is an environmental commitment. Six sites were identified (see Figure 2-3 in Chapter 2, "Alternatives"). Restoration would occur at one or a combination of these six sites to provide rearing and/or spawning habitat for anadromous fish in the upper Sacramento River as far downstream as river mile 275. This restoration component was added to the alternatives working in coordination with USFWS and CDFW.

DSFISH-4 – Maintaining Sacramento River Flows to Meet Fish Needs and Regulatory Requirements

Comments were received relating to the importance of downstream flows for fish reproduction and survival.

CVP and SWP operational assumptions in the CalSim-II modeling were based on operational requirements in the 2009 NMFS BO and 2008 USFWS BO and associated reasonable and prudent alternatives (RPA). The operations in the BOs that were directly modeled in CalSim-II are described in the EIS Modeling Appendix, Chapter 2, "CalSim-II". The 2008 USFWS BO and 2009 NMFS BO include requirements for Sacramento River flows and temperature at various locations, Shasta Reservoir carryover storage, operational restrictions at Red Bluff Diversion Dam, and Delta X2 flow requirements. The minimum flow requirement below Keswick Dam is based on a combination of State Water Board Water Rights Order 90-5 requirements, CVPIA 3406(b)(2) flows, and Action I.2.2 in the 2009 NMFS BO. From May through September, the minimum flow is always 3,250 cfs. In other months, the minimum flow requirement varies from 3,250 to 4,500 cfs. These requirements are intended to benefit listed fish species based on evaluations conducted by both NMFS and USFWS.

Early studies in the SLWRI alternatives development were conducted to determine if adjusting flows to meet those identified in the AFRP goals would provide greater value to fisheries (i.e., result in larger increases in juvenile production) than reductions in water temperature. Results showed that reduced water temperatures resulted in significantly greater increases in juvenile production than increased flows. As a result, the flows were maintained at the current standards to provide the longest duration of temperature benefits.

The SLWRI operations are tailored to meet the current BOs which do not require pulse flow releases from Shasta Dam. New scenarios that included pulse flows were not included in the discussions with the resource agencies during the plan formulation process, and were therefore not included in the Comprehensive Plans. If pulse flows will be required, they will be included in the project-specific BO or any new operations BO resulting from reconsultation actions.

Whether or not the SLWRI is implemented, the operations of Shasta Dam will follow the requirements established under the RPAs established under both the 2008 USFWS BO and 2009 NMFS BO, including any future BOs resulting from reconsultation actions, as well as any SLWRI-specific BO. As part of a multi-agency agreement, the Water Operations Management Team (WOMT), a management-level group of representatives of Reclamation, DWR, CDFW, NMFS, and USFWS, has been established, and meets weekly for review of CVP/SWP operations. Based on these meetings, the WOMT makes recommendations to state and regional directors for final action. Technical teams, including the Sacramento River Temperature Task Group (SRTTG) and the WOMT work within those implementation procedures to meet discretionary water contract obligations to the greatest extent consistent with survival and recovery of listed species to avoid jeopardizing the species. The responsibilities of and interaction between the WOMT and the technical teams are thoroughly described in Chapter 11, "Fisheries and Aquatics Resources," Section 11.2.1, "Regulatory Framework – Federal."

NMFS is the Federal resource agency with jurisdiction over, and therefore responsible for, the protection of Chinook salmon. Winter-run Chinook salmon are listed as endangered under the ESA and exist in a single population in the Sacramento River, whereas spring-run, while also listed (as a threatened species), have their core populations in other tributaries and fall-run Chinook salmon are not currently listed and are widely distributed throughout the Central Valley. NMFS direction to focus more on winter-run Chinook salmon is due to the single core population status of winter-run being more at risk to mortality factors in the upper Sacramento River in comparison with the other runs. In 2013, for example, several federally protected winter run salmon spawned later than normal in August. NMFS determined that high water must be maintained into early November to protect the incubating winter-run Chinook salmon eggs. However, to protect carry-over storage in the face of a potentially long-term drought, flows were immediately dropped thereafter, at the risk of dewatering fall-run Chinook salmon redds.

DSFISH-5 – Fish and Wildlife Coordination Act Report

Commenters cite the Draft Fish and Wildlife Coordination Act Report (CAR), prepared by the USFWS in 2007, as a basis of comparison for the DEIS SALMOD results and as being documentation for SLWRI not showing benefits to Chinook salmon. Reclamation feels that the CAR is misleading in the use of the Draft CAR as a citation for several reasons: (1) the Draft CAR is based on the 2007 Plan Formulation Report, and has not been updated based comments provided by Reclamation, or on the public release versions of the DEIS, (2) the CAR results do not evaluate the production in critical and dry years separate from other water year types, and (3) water operations described in the CAR are

based on the 2004/2005 BOs. The public release DEIS was updated to include the operational requirements in the 2009 NMFS BO and 2008 USFWS BO and associated RPAs.

According to NMFS in their Final Recovery Plan for the Evolutionarily Significant Units of Sacramento River Winter-run Chinook Salmon and Central Valley Spring Run Chinook Salmon and the Distinct Population Segment of Central Valley Steelhead (NMFS 2014), Chinook salmon populations, especially winter-run Chinook, are highly vulnerable to global and localized climate changes, including prolonged drought conditions. This is caused by reduced volumes of cold water that can be released from the reservoirs, including Shasta Lake, thus affecting the spawning and rearing habitat conditions. On page 21 of the Final Recovery Plan, NMFS states:

> *The fact that this ESU is comprised of a single population with very limited spawning and rearing habitat increases its risk of extinction due to local catastrophe or poor environmental conditions. There are no other natural populations in the ESU to buffer it from natural fluctuations. A single catastrophe with effects persisting for four or more years could result in extinction of the Sacramento River winter-run Chinook salmon ESU (Lindley et al. 2007). Such potential catastrophes include volcanic eruption of Lassen Peak,* ***prolonged drought which depletes the cold water pool in Shasta Reservoir*** *or some related failure to manage cold water storage, a spill of toxic materials with effects that persist for four years, or a disease outbreak.* [emphasis added]

Additionally, the Recovery Plan states:

> *Water temperatures in the upper Sacramento River are the result of interaction among: (1) ambient air temperature; (2) volume of water; (3) water temperature at release from Shasta and Trinity dams; (4) total reservoir storage; (5) location of reservoir thermocline; (6) ratio of Spring Creek Power Plant release to Shasta Dam release; (7) operation of Temperature Control Device (TCD) on Shasta Dam; and (8) tributary inflows (NMFS 1997). Water temperature varies with location and distance downstream of Keswick Dam, and depends upon the annual hydrologic conditions and annual operation of the Shasta-Trinity Division of the CVP (NMFS 1997). In general, water released from Keswick Dam warms as it moves downstream during the summer*

> *and early fall months at a critical time for the successful development and survival of juvenile winter-run Chinook salmon (NMFS 1997).*
>
> *After two years of drought, Shasta Reservoir storage would be insufficient to provide cold water throughout the winter-run Chinook salmon spawning and embryo incubation season, resulting in partial or complete year class failure. A severe drought lasting more than 3 years would likely result in the extinction of winter-run Chinook salmon. The probability of extended droughts is increasing as the effects of climate change continue (see Chapter 6).*

The 2009 NMFS BO RPA Action Suite I.2 indicate that the Shasta Lake cold water pool must be managed to maintain suitable water temperatures and habitat for winter-run Chinook salmon downstream from Shasta Dam, particularly in critical water years, extended drought years, and under future conditions, which will be affected by increased downstream water demands and climate change.

Moreover, an evolutionarily significant unit (ESU) that is represented by a single population is vulnerable to the limitation in life history and genetic diversity that would otherwise increase the ability of individuals in the population to withstand environmental variation. Although the status of winter-run Chinook salmon is improving, there is only one population, and it depends on cold water releases from Shasta Dam, which would be vulnerable to a prolonged drought. SLWRI benefits to anadromous salmonids are focused on dry and critically dry years, because this is when they are believed to be the most vulnerable.

The USFWS believes that all water year types should be treated equally with respect to the SALMOD results, and so combine all results together into a single average. This implies that Chinook salmon survival is equal in all water year types. However, historic conditions have proven this not to be the case, and that Chinook salmon survival is, indeed, lower in critical and dry water year. Therefore, the SLWRI is formulated to provide the greatest benefits to anadromous fish in dry and critical water years when storage has been so low that water released from Shasta has been unable to meet minimum flow and/or water temperature requirements. This is when the anadromous fish are believed to be the most vulnerable.

While there are, overall, fewer critically dry water years, critically dry water years are the most important years for increasing the survival (or reducing the risk of extirpation) of the anadromous fishes in the Sacramento River, particularly when there is a series of critical and dry

water years. The low storage levels caused by multiple dry years result in an inadequate supply of cold water available to maintain high survival of anadromous fish in the river below Keswick Dam. This results in warmer, above-survival threshold temperatures which increases temperature-related mortality and results in lower production (i.e., the number of juvenile fish that survive to pass the Red Bluff Pumping Plant). Therefore, increasing storage, and in particular, the cold water pool, targeting the release of the cold water for critical and dry water years, increases the benefits to Chinook salmon and steelhead during the critical and dry years. The SLWRI is not expected to significantly increase fish production during wet, above normal or below normal water year types because the cold water pool benefits of the additional storage are optimized to provide water temperature benefits during critical and dry water years when populations are most at risk. In the simulated 83 years modeled in CalSim-II, 13 years (15.6 percent) were identified as critical water years, and 17 (20 percent) were identified as dry water years. As described in the DEIS Chapter 11, "Fisheries and Aquatic Ecosystems," Section 11.3.3, "Direct and Indirect Effects," the number of years with significant increases (greater than 5 percent) in the production index for each run under CP4 compared to the No-Action Alternative for all years combined, and then for critical and dry years combined respectively are:

- Winter-run Chinook salmon – 7 years and 6 years
- Spring-run Chinook salmon – 16 years and 12 years
- Fall-run Chinook salmon – 9 years and 8 years
- Late fall-run Chinook salmon –11 years for both

One must consider that of these 30 combined critical and dry years, there were 4 occasions in which a series of dry and critical years occurred. The first period was three years, from 1924 through 1926,with one critical water year, the second was 6 years, 1929 through 1934, with 2 of those years being critical water years, water years 77 and 78, both critical water years, and the final period, between 1987 and 1992, 4 years of which were critical water years. Drought periods lasting 3 years or longer severely deplete the reservoir and the cold water pool, regardless of storage capacity. However, by increasing the storage capacity, the impact to the fishery is delayed, providing available water for a longer period of time than would occur under the No-Action alternative condition. Additionally, the largest increase, in production for each run occurs during each of these drought periods.

In the majority of the years (primarily wet, above normal, and below normal) there were minimal changes in the production index (less than 5 percent). As described in Master Comment Response DSFISH-1, "SALMOD Model for Sacramento River Chinook Salmon," production indices that were within ±5 percent were considered to have no detectable difference from the production indices of the basis-of-comparison (Existing Condition or No-Action Alternative).

Other comments indicate that while decreasing water temperatures are important, improving other factors such as access to juvenile rearing habitat, fish screens, and flow management to reduce redd dewatering would likely have more substantial effects on the long-term survival of anadromous fish in the Sacramento River. Reclamation agrees that these components are extremely important to the survival of anadromous salmonids. However, to meet both primary objectives of the SLWRI, the most effective way to easily and successfully increase anadromous fish survival is to reduce water temperatures as well as improve access to rearing habitat (through the proposed restoration actions). Reclamation is currently working on flow management actions to reduce redd dewatering, and is also actively identifying and screening top priority diversions to reduce fish entrainment. By reducing water temperatures, Reclamation gets closer towards goals identified in the Recovery Plan (2014) and by increasing juvenile production there is a greater chance of getting closer to the doubling goals defined in the AFRP.

DSFISH-6 – Historic Dam Effects on Fisheries

Comments were received related to the harm done to fish by the construction of Shasta Dam and the need to remedy that harm. The original construction of Shasta Dam which occurred between 1938 and 1945 resulted in blocking fish from their historic habitat. Because the SLWRI involves raising the existing dam, this project does not mitigate for blocking fish from the upstream migration. CVPIA has programs in place to mitigate for the original structure, including adding spawning gravel downstream from Shasta Dam and providing a supply of water that is released on a schedule to specifically benefit downstream fish populations. Additionally, the USFWS and NMFS BOs for the CVP/SWP operations provide RPAs that establish measures to help 'mitigate' for fisheries losses resulting from the presence of Shasta Dam as well as Shasta operations. The 2009 NMFS BO RPA Action V covers fish passage past Shasta Dam (see also Master Common Response FISHPASS-1, "Fish Passage Above Shasta Dam").

DSFISH-8 – National Marine Fisheries Service Recovery Plan, Anadromous Fish Restoration Program, Doubling Goals and Biological Opinions

Comments were received related to the relationship between the SLWRI and the Draft Sacramento River winter-run Chinook salmon, Central

Valley Spring-run Chinook salmon and Central Valley steelhead Recovery Plan (Recovery Plan) (NMFS 2009) and/or the Anadromous Fish Restoration Plan (ARFP) doubling goals. In July 2014, following the end of the public comment period for the DEIS, NMFS released the Final Recovery Plan. The Draft Recovery Plan was used in the development of the action alternatives, particularly with respect to achieving winter-run Chinook salmon recovery by improving water temperature conditions in the Sacramento River. The SLWRI is also in alignment with the requirements identified in the Final Recovery Plan. Further discussion in this MCR references the requirements established in the Final Recovery Plan.

The SLWRI, on its own, cannot achieve the AFRP doubling goal (3406(b)(1) of the CVPIA) or fully meet the NMFS Recovery goals for the listed anadromous fish species, but will work towards achieving these goals in conjunction with other programs. The Recovery Plan does not include SLWRI, but does include a recommendation for increasing the Shasta Lake cold water pool. To maintain current operations, and increase the cold water pool, the most viable way to achieve both and have increased water during dry and critical water years is to increase the elevation of the lake, thus increasing the volume and providing the ability to manage a larger cold water pool. As well, by increasing the overall production of juveniles, the SLWRI provides the potential for an increase in returning adults provided the juveniles survive downstream stressors (e.g., habitat conditions, water temperatures, predation, entrainment issues, ocean conditions etc.) not caused by the project.

Moreover, an ESU that is represented by a single population is vulnerable to the limitation in life history and genetic diversity that would otherwise increase the ability of the population to withstand environmental variation. Although the status of Sacramento River winter-run Chinook salmon may be improving, there is only one population existing in only one river, and it depends on cold water releases from Shasta Dam, which would be vulnerable to a prolonged drought. The project would be managed to provide benefits to anadromous salmonids focused on dry and critically dry years, because monitoring has shown this is when these populations are the most vulnerable.

All alternatives provide increases, often substantial, in salmonid populations during drought periods. Many sources identify that Upper Sacramento River water temperatures, particularly during dry and critical water years, are highly important to anadromous fisheries and are considered a limiting factor to these species. Increasing the cold water pool in Shasta Lake to benefit anadromous fish was specifically identified in the Recovery Plan. Per the Recovery Plan, water temperatures and flow, particularly during dry and critically dry years

(e.g., drought periods) are stressors of "very high" importance. According to Recovery Plan, Chinook salmon populations, especially winter-run Chinook, are highly vulnerable to global and localized climate changes, including prolonged drought conditions (NMFS 2014). This is caused by reduced volumes of cold water that can be released from the reservoirs, including Shasta Lake, thus affecting the spawning and rearing habitat conditions.

Implementation of the Recovery Plan is not the intent of the SLWRI, but implementation of the SLWRI and the resulting increase in juvenile production during critical and dry water years does work towards achieving the goal of recovery by improving habitat conditions for anadromous fish in the Sacramento River between Keswick Dam and Red Bluff, as shown throughout Chapter 11, "Fisheries and Aquatic Ecosystems." This is accomplished by providing improved water conditions during critical water years, as described above, as well as including restoration actions under CP4, CP4A and CP5, as described in Chapter 2, "Alternatives."

Reclamation chose to focus the riparian, side channel and floodplain restoration along the Sacramento between Keswick Dam and Red Bluff, partially because of the natural topography and hydrology of the region. The restoration actions are to promote the health and vitality of the river ecosystem, and would not conflict with other known programs or projects on the upper Sacramento River. The restoration would support the goals of the Sacramento River Conservation Area Forum, CALFED (as currently managed by the Delta Stewardship Council and other entities), and other programs associated with riparian restoration along the Sacramento River.

See also Master Comment Response DSFISH-3, "Fish Habitat Restoration," and Master Comment Response DSFISH-4, "Maintaining Sacramento River Flows to Meet Fish Needs and Regulatory Requirements."

DSFISH-9 – Flow-Related Effects on Fish Species of Concern

Comments were received related to effects to downstream flows and fish species of concern. Chapter 11, "Fisheries and Aquatic Ecosystems," describes the effects of the project alternatives on fish species of concern in the study area, and makes commitments to mitigate for adverse effects to the extent feasible. Chapter 12, "Botanical Resources and Wetlands," describes the effects of the project on downstream riparian and riverine habitat and makes commitments to mitigate for adverse effects to the extent feasible. As described in Chapter 12, "Botanical Resources and Wetlands," Section 12.3.5, "Mitigation Measures," and Chapter 11, "Fisheries and Aquatic Ecosystems," Section 11.3.4 "Mitigation Measures," under Mitigation Measure Bot-7 and Aqua-14, Reclamation

will implement a riverine ecosystem mitigation and adaptive management plan to mitigate to the extent feasible any identified potentially significant or significant impacts to federally and state-protected fish species as a result of possible reductions in the magnitude, duration, or frequency of intermediate to large flows both in the upper Sacramento River and in the lowermost (confluence) areas of tributaries (Impact Aqua-14- *Reduction in Ecologically Important Geomorphic Processes in the Upper Sacramento River Resulting from Reduced Frequency and Magnitude of Intermediate to High Flows*). The plan will be consistent with and will support implementation of the Senate Bill 1086 program, and will be developed in coordination with USFWS, NMFS, CDFW, and the Sacramento River Conservation Area Forum. The Plan will be developed before project construction.

Implementation of this mitigation measure would be aimed at reducing potential impacts to federally and state-protected fish species resulting from potential reduced habitat inundation and reduced high water periods. Additionally, CP4, CP4A and CP5 include a 10-year gravel augmentation program as an environmental commitment and the restoration of riparian, floodplain, and side-channel habitat. These additional efforts will offset potential effects to federally and state-protected fish species from Impact Aqua-14.

Under all alternatives, there would be no change to access to rearing habitat in the Feather, American, and Trinity Rivers. Implementation of Mitigation Measure Aqua-15 would maintain flows in the Feather, American, and Trinity Rivers pursuant to existing operational agreements, Biological Opinions, and standards that are protective of fisheries resources. Sacramento River salmonids use the Feather and American rivers as juvenile rearing areas.

DSFISH-10 – Methodology for Evaluating Fisheries Impacts

Comments were received related to the methodology for evaluating downstream fisheries impacts. NEPA requires that Federal Agencies shall ensure the professional integrity, including scientific integrity, of the discussions and analyses in EISs. They shall identify any methodologies used and shall make explicit reference by footnote to the scientific and other sources relied upon for conclusions in the statement. An agency may place discussion of methodology in an appendix (CFR 1502.24). Reclamation, through the scoping process and discussions with agencies and stakeholders, has performed information gathering and focused studies to document resource conditions and evaluate the potential impacts of the range of alternatives developed through the SLWRI feasibility study. The tools used to evaluate impacts of the alternatives were selected based upon Reclamation's standard practices and input from agencies and subject matter experts. The models used in

the fisheries analyses included CalSim-II, SALMOD, and the Sacramento River water temperature model.

CalSim-II is the hydrologic and CVP/SWP systems operations model that was used for this EIS as it is the standard model used for CVP/SWP systems analysis, including in EISs prepared by Reclamation. CalSim-II is able to simulate the operation of the complete CVP-SWP system in all areas that contribute flow to the Delta in monthly time-steps. No other tool is available that can simulate CVP/SWP operations on a daily basis. Both USFWS and NMFS used CalSim-II to generate the hydrology and operations data that was input to all fisheries models used in analyses for the 2008 USFWS BO and 2009 NMFS BO. The courts did not consider CalSim-II to be an inappropriate or invalid tool for those analyses, and found that there are no other widely accepted and verified tools currently available to simulate systemwide water operations. CalSim-II is the best tool currently available. As described in Chapter 3, "Temporal Downsizing of CalSim-II Flows for Use in Temperature Modeling," for each alternative, temporal downscaling was performed on the CalSim-II monthly average tributary flows to convert them to daily average flows for HEC-5Q input. Monthly average flows were converted to daily tributary inflows based on the 1921 through 2003 daily historical record for aggregated inflows. As described in Chapter 4, "Sacramento River Water Quality Model," a HEC-5Q model was developed and calibrated for simulating water temperature in the upper Sacramento River system. Using system flows computed by HEC-5, HEC-5Q computes the distribution of temperature in the reservoirs and in stream reaches. HEC-5Q is designed for long-term simulations of flow and temperature using daily average hydrology and 6-hour meteorology. A 6-hour time step approximates diurnal variations in temperature.

SALMOD is a computer model used on the SLWRI to simulate population dynamics for all four runs of Chinook salmon between Keswick Dam and RBPP. SALMOD was applied to this project because the model has been used on the upper Sacramento River (from Keswick Dam to Battle Creek), and has been updated using model parameters and techniques developed for use on the Klamath River and from Sacramento River-specific Chinook salmon information obtained from USFWS and CDFW fisheries biologists (Bartholow 2003; Modeling Appendix, Chapter 5). Also, resource agency personnel were presented with the capabilities of the model by John Bartholow (formerly with the U.S. Geological Survey (USGS)) under contract by Reclamation, and agreed that using SALMOD was the appropriate means of evaluating potential conditions. John Bartholow and John Heasley (contractor to USGS) were instrumental in extending SALMOD to assess fish production and mortality between Keswick Dam and RBPP. They also assisted in preparation of the SALMOD description included in the Modeling Appendix, Chapter 5, which contains a detailed discussion of

the SALMOD model. The USGS completed a thorough review and update of model parameters and techniques on the Klamath River that enabled a smooth transfer of relevant model parameters to the Sacramento River (Bartholow and Henriksen 2006). SALMOD was peer reviewed by Lisa Thompson and Chris Mosser of the University of California (UC) Davis (Thompson and Mosser 2011), and has been approved for use in several other Federal level studies, including Reclamation's 2008 Biological Assessment on the Continued Long-Term Operations of the CVP and SWP for compliance with Section 7 of the ESA (Reclamation 2008) and resulting NMFS 2009 BO (NMFS 2009a).

Information pertaining to the Sacramento River water temperature model can be found in Chapter 11, "Fisheries and Aquatic Ecosystems," and in Chapter 5, "Anadromous Fish Production Simulation (SALMOD)," of the Modeling Appendix.

33.3.30 Master Comment Responses for Endangered Species Act

ESA-1 – Compliance with the Endangered Species Act

Comments were received related to the ESA compliance for SLWRI. Some comments referenced the Draft Feasibility Report which used the NMFS 2004 B*iological Opinion on the Long-Term Central Valley Project and State Water Project Operations Criteria and Plan* (NMFS 2004) and USFWS 2005 *Biological Opinion on the Coordinated Operations of the Central Valley Project and State Water Project in California* (USFWS 2004). Analysis for the DEIS relied on the updated 2008 USFWS BO and the 2009 NMFS BO.

Reclamation has coordinated with and received technical assistance from NMFS and USFWS for the SLWRI. Reclamation will comply with the Section 7 of the ESA by selecting a preferred alternative (ESA proposed action) and preparing a BA and conducting formal consultation. The Final EIS includes an update of the ESA consultation process, and the resultant BOs will be considered in the ROD. If any dam enlargement was authorized for construction and operation, Reclamation would also evaluate its obligations under other biological opinions.

CESA does not apply to Federal agencies and their actions. However, if or when a CEQA lead agency has been identified, the CEQA lead will need to determine if State laws and regulations are applicable for any state or local actions. This would include compliance with the provisions of CESA.

33.3.31 Master Comment Responses for Fish Passage

FISHPASS-1 – Fish Passage Above Shasta Dam

Several comments reflect concerns regarding potential of fish passage into the streams above Shasta Lake. Some comments raised concerns that the DEIS is incomplete because it did not include an evaluation of passing Chinook salmon into the streams above Shasta Dam. As discussed below, multiple management measures for fish migration above Shasta Dam were evaluated and eliminated during the plan formulation process. Additionally, Reclamation is currently studying the feasibility of volitional and non-volitional fish passage above Shasta Dam under a separate Federal program as the result of the 2009 NMFS BO. The original construction of Shasta Dam, which occurred between 1938 and 1945, blocked fish from their historic habitat upstream from Keswick Dam. Reclamation understands the importance of evaluating opportunities for reestablishing viable populations of listed Chinook salmon runs upstream from Shasta Dam. The SLWRI does not include a fish passage component into any of the action alternatives, and would not mitigate, nor is required to mitigate, for past actions that blocked fish from continuing the upstream migration.

Below is a summary of the management measures considered to improve fish migration that were evaluated, and deleted, during the plan formulation process. For more information, please see Master Comment Response ALTD-2, "Alternative Development – Anadromous Fish Survival" and the Plan Formulation Appendix, Chapter 2, "Management Measures," Section "Increase Anadromous Fish Survival," within Section "Measures to Address Primary Planning Objectives."

Construct a Migration Corridor from the Sacramento River to the Pit River This measure consisted of providing passage to spawning areas upstream from Shasta Dam for anadromous fish from the Sacramento River. This measure and similar measures were initially deleted from further consideration during earlier phases of the SLWRI primarily because of (1) the high cost for complex infrastructure, (2) major impacts to other facilities and extensive long-term operation and maintenance requirements, and (3) high uncertainty for the potential to achieve and maintain successful fish passage and spawning. However, Reclamation is currently studying volitional fish passage above Shasta Dam under a separate Federal program as the result of the 2009 NMFS BO.

Construct a Fish Ladder on Shasta Dam This measure primarily included constructing a fish ladder on Shasta Dam to allow anadromous fish to access Shasta Lake and approximately 40 miles of the upper Sacramento River, about 24 miles of the lower McCloud River, and

various small creeks and streams tributary to Shasta Reservoir. This measure was initially deleted from further consideration during earlier phases of the SLWRI primarily because of the estimated high cost to construct and operate the fish ladder and potential inability for fish to successfully ascend the ladder. However, Reclamation is currently studying volitional fish passage above Shasta Dam under a separate Federal program as the result of the 2009 NMFS BO.

Reintroduce Anadromous Fish to Areas Upstream from Shasta Dam
This measure, which was requested as part of the environmental scoping process, primarily included non-volitional fish passage above Shasta Dam, involving trapping anadromous fish along the upper Sacramento River likely just downstream from Keswick Dam, transporting the fish by tanker truck, and releasing the fish in the Sacramento River upstream from Shasta Lake or the McCloud River to spawn. It also included some method of trapping potential out-migrating fish and transporting them to the Sacramento River near Keswick for release into the lower river. This measure was deleted from further consideration in the SLWRI primarily because non-volitional fish passage above Shasta Dam to the upper Sacramento and McCloud rivers is being studied under a separate Federal program as the result of the 2009 NMFS BO.

Furthermore, the SLWRI describes the Shasta Dam fish passage evaluation in Chapter 3, "Considerations for Describing Affected Environment and Environmental Consequences," Section 3.2.9, "Cumulative Effects." Additionally, Chapter 11, "Fisheries and Aquatic Ecosystems," Section 11.3.5, "Cumulative Impacts" has been updated to include a qualitative discussion of the potential effects to reintroduced Chinook salmon upstream from Shasta Dam resulting from the implementation of the SLWRI. NMFS identified the necessity of reintroducing Chinook salmon upstream from Shasta Dam in both the 2009 Draft Recovery Plan and 2014 Final Recovery Plan, and in the 2009 NMFS BO. In the 2009 NMFS BO, NMFS included an action in the RPA to pass fish upstream from Shasta Dam. As a requirement of the RPA, Reclamation is currently working collaboratively with NMFS, USFWS, CDFW, DWR, USFS, the State Water Board, and a consultant team on developing a Pilot Implementation Plan through the Shasta Dam Fish Passage Evaluation to study the feasibility of successfully reintroducing Sacramento River winter-run Chinook salmon (and potentially later Central Valley spring-run Chinook salmon and Central Valley steelhead) into the Sacramento River and/or McCloud River upstream from Shasta Dam.

The Shasta Dam Fish Passage Evaluation was not included in the No Action or action alternatives in the SLWRI DEIS because it did not meet the criteria established for inclusion as a reasonably foreseeable project and was considered too speculative at the time the SLWRI DEIS was

developed. However, since the DEIS was completed, the Shasta Fish Passage Evaluation has proceeded to the point where a pilot plan is being developed, with the intent of implementing a pilot fish passage program to test the feasibility of fish reintroduction upstream from Shasta. The pilot fish passage program is scheduled to begin in 2015, before any SLWRI authorization would occur. As this pilot plan has not been finalized, valuating potential enhancements to this program is too speculative at this time.

Inundating the lower reaches of the McCloud and/or Sacramento rivers will not impact potential spawning habitat for reintroduced Chinook salmon. The suitable habitat for winter-run spawning is upstream in the cooler reaches of the rivers, well above the inundation area of any of the dam raise scenarios. Water temperatures in the lower reaches of the Sacramento and McCloud rivers are too warm to support winter-run egg incubation with or without a higher dam. Spring-run Chinook could potentially use spawning habitat near the lake and within the inundation area but spring-run spawning would occur in the September timeframe when the lake would be in a drawn down state and these areas would not be inundated. Spawning and egg incubation could still successfully occur in these stream reaches. The increased inundation may reduce a maximum of less than 2 percent of juvenile rearing and migrating habitat as measured by the proportion of the length of the mainstems of these streams inundated.

Increasing the cold water pool in Shasta will improve conditions for the downstream populations of listed Chinook salmon. This, in conjunction with a reintroduction of Chinook salmon upstream from Shasta will result in improving the likelihood of ESU survival, particularly in view of climate change. No changes were being made to the Final EIS in response to these comments.

33.3.32 Master Comment Responses for Environmental Impacts

EI-1 – Intent of NEPA Process is to Provide Fair and Full Discussion of Significant Environmental Impacts

Comments were received relating to the general impacts of the SLWRI on the environment and people of California. An EIS describes the beneficial and adverse effects on the human environment of a proposed action and a reasonable range of alternatives, and is intended to inform decision making on the proposed action. Although a "Preferred Alternative" is identified, an EIS does not approve or reject a project. The SLWRI EIS does not make a decision but may provide the basis for an informed and reasonable decision. Chapter 1, “Introduction,” of the SLWRI DEIS and Final EIS, Section 1.5, describes the “Intended Use of EIS.” The SLWRI DEIS provides a full and fair discussion of significant environmental impacts (as required by 40 CFR 1502.1) through the

evaluation of reasonable range of alternatives which could feasibly achieve the purpose and need of the proposed action. The DEIS has been enhanced through the responses to public comments and through additions to the Final EIS. The evaluation of environmental impacts in an EIS is intended to aid the public and decision makers in the decision-making process. The ranges of alternatives evaluated are those which would avoid or minimize adverse environmental impacts, or enhance the quality of the human environment.

The Final EIS examines the potential environmental effects of proposed alternatives for the SLWRI where beneficial or adverse impacts are identified, and discusses measures to mitigate adverse effects. The Final EIS incorporates comments received on the DEIS and responses to those comments. The Final EIS will be published along with the Final Feasibility Report, and together the documents will be used to determine the type and extent of Federal interest in enlarging Shasta Dam and Reservoir. The Final EIS and Final Feasibility Report will be presented together for the purposes of making a Federal decision. If a Federal decision is made regarding enlargement of Shasta Dam, it will be documented in the ROD.

Following finalization of the NEPA process, the administrative record will be submitted by the Commissioner of Reclamation to the Secretary of the Interior. After review by the Office of Management and Budget, in accordance with Executive Order 12322, Water Resources Projects, the Secretary will transmit the administrative record and a recommendation on the Federal interest in enlarging Shasta Dam to Congress. The proposed project would be considered for authorization by Congress.

EI-2 – Potential Impacts to Bank Swallow and Bank Swallow Habitat

Comments received related to the potential impacts to riparian species, particularly bank swallows, a State protected species. Chapter 13, “Wildlife Resources,” contains the analysis of effects of the No Action and the action alternatives on riparian habitat and wildlife. All impact analyses for bank swallow conclude that impacts would be “less than significant” and not "no impact." Impact conclusions for the No-Action Alternative (Impacts Wild-18 and Wild-24) are supported by an analysis that states “...future conditions for bank swallows are not expected to differ substantially from existing conditions” because “only very small changes in flows would occur along the … Sacramento River…[which] would result in no change to the ongoing geomorphic processes in the Sacramento River.” The conclusions for the CP1 through CP4 alternatives on bank swallow are outlined in the corresponding discussions under Impacts Wild-18 and Wild-24. As stated in Chapter 13, “Wildlife Resources,” Section 13.3.1, “Methods and Assumptions,”

the impact analyses were "based on review of the output from the SLWRI 2012 Version CalSim-II model. Monthly averages by water year type were reviewed for substantial trends in stage or flow that could alter habitat used by sensitive species or affect species directly. Trend data generated by CalSim-II were considered representative of the potential changes resulting from the project alternatives. A change of less than 2 percent (plus or minus) was considered essentially equivalent to baseline operations and therefore not a substantial change. When monthly average values were changed more than 2 percent, the alternative was considered to result in a substantial change in a species habitat or directly affect the species. The use of averages in the evaluation was considered more representative of potential long-term changes in flows than values from the individual months." This modeling supports the conclusions in the DEIS.

The analysis in the DEIS was informed by the CalSim-II modeling study; the CALFED Ecosystem Restoration Program study from March 2008 (TNC et al. 2008) was also consulted for this analysis. The modeling indicates that there would not be a substantial increase in flow and river stage during the nesting season; therefore, the implementation of the action alternatives would avoid nest failure. The modeling also indicated that although there would be a decrease in winter flows in some water year types (specifically, above normal and dry), the flow level would not be substantially changed in other years. In addition, the bank swallow analysis for CP1 has been expanded to include additional text from the hydrology and botanical analyses.

Reclamation also used the "Linkages Report" (Stillwater 2007) and the "Sacramento River Ecological Flows Study" (TNC et al. 2008) to augment its own analysis based primarily on CalSim-II modeling. As noted in the CP1 impact analysis for bank swallow, although much of the bank swallow analysis does rely upon mean monthly flow data, daily flow data were analyzed and used to assess impacts on this species.

EI-3 – Botanical Resources Effects Related to Flow Regimes

Comments were received related to the importance of geomorphic processes to downstream habitat. Chapter 12, "Botanical Resources and Wetlands," of the DEIS describes potential impact of the alternatives on habitat and ecosystem functions. The DEIS acknowledges the potential adverse effects of altered flow regimes on the structure and species composition of riparian communities and concludes that this impact would be significant. The importance of channel migration and other geomorphic processes to riparian vegetation is discussed at length under Impact Bot-7 for each alternative. For example, in Chapter 12, "Botanical Resources and Wetlands," Section 12.3.4, "Direct and Indirect Effects," CP1 impact Bot-7 states, "River flows not only affect the survival and growth of established riparian vegetation, but also

create sites for establishment of early-successional vegetation. The geomorphic processes of channel meander migration, avulsion, and deposition of sediment on floodplains, which result primarily from intermediate and large flows, bury and uproot herbaceous vegetation and uproot or undercut trees and shrubs. These disturbances also create opportunities for early-successional vegetation to establish, including willow and cottonwood seedlings that grow to form willow scrub and Great Valley cottonwood riparian forest. Early successional riparian communities change rapidly in structure and species composition (Tu 2000, Fremier 2003, Vaghti and Greco 2007). Over several decades, early-successional vegetation develops into mid- and late-successional vegetation with less willow and cottonwood and a greater abundance of other trees, including box-elder, Oregon ash, black walnut, and valley oak (e.g., Great Valley mixed riparian forest) (Fremier 2003)." As described under Mitigation Measure Bot-7 in the DEIS, a riverine ecosystem mitigation and adaptive management plan will be implemented to avoid and compensate for the effects of altered flow regimes on riparian and wetland communities. Specific adaptive management actions that could be implemented in response to observed adverse changes in riparian and wetland plant communities in response to altered hydrology include modification of dam operations and funding restoration actions to avoid and compensate for impacts on riparian and wetland communities. The mitigation and adaptive management plan incorporates no-net-loss performance standards for riparian habitat functions. The DEIS also identifies implementation of a comprehensive revegetation plan and a comprehensive mitigation strategy to minimize potential effects on biological resources in its environmental commitments on pages ES-32 and ES-33. With implementation of Mitigation Measure Bot-7, the impact of altered flow regimes on instream, riparian, and wetland communities would be reduced to a less-than-significant level and there would be no net loss of these communities in the long term.

EI-4 – Socioeconomic and Associated Indirect Environmental Effects

Comments were received on the DEIS related to various existing water supply shortage issues and the associated socio-economic and indirect effects to the environment. Chapter 16, "Socioeconomic, Population, and Housing," of the DEIS describes socioeconomics, population, and housing characteristics in the primary and extended study areas, including CVP/SWP Service Areas. Chapter 16, "Socioeconomic, Population, and Housing," Section 16.3, "Environmental Consequences and Mitigation Measures," describes the potential socio-economic consequences resulting from each of the proposed alternatives including the No Action Alternative. Direct, indirect, and cumulative effects of the alternatives are discussed within this section. When potential environmental consequences are identified, specific mitigation measures

to offset the potential effects of the alternatives are presented. Potential effects and mitigation measures address topics related to population, demographics, and housing, employment and labor force, business and industry, and government and finance. For a more detailed discussion of the information presented in Chapter 16, "Socioeconomic, Population, and Housing," see the *Socioeconomics, Population, and Housing Technical Report*.

As described in Chapter 16, "Socioeconomic, Population, and Housing," Section 16.2, "Regulatory Framework," the analysis of socioeconomic resources is guided primarily by Federal laws and policies. State and local laws and policies typically promote economic development and diversity, environmental justice, public health and safety, housing, and address the concerns of the residents within their jurisdictions.

During previous decades, the CVP was able to provide a more reliable water supply, and communities and viable local economies developed. But, reduced CVP water supplies due to regulatory constraints have and continue to cause CVP contractors to make water supply decisions that may have physical effects related to the reliance on groundwater to substitute for lost CVP supplies. These include reduced groundwater levels from overdraft, surface subsidence, adverse impacts to crops and soil from reliance on poor quality groundwater, increased energy use, and impacts to air quality. Shortages of CVP supplies have also caused changes in land use patterns, loss and destruction of permanent crops, and/or decreased production of existing crops. In response to reduced water supplies, farmers will fallow fields, reducing agricultural productivity directly results in layoffs, reduced hours for agricultural employees, and increased unemployment in agricultural communities. Reduced agricultural productivity also has indirect 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 tax-based revenues for local government services 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 and/or augment supplies. Connection fees and other one-time costs for new developments may also increase and further retard economic development. All these impacts were explained and found in recent federal court cases regarding NEPA impacts from reduced CVP

deliveries. (See e.g., The Consolidated Delta Smelt Cases, 717 F.Supp.2d 1021 (E.D. Cal. 2010), The Consolidated Salmonid Cases, 713 F.Supp.2d 1116 (E.D. Cal. 2010).)

None of these effects are associated with any SLWRI action alternatives, which would improve water supply reliability. Therefore, SLWRI action alternatives do not cause a cumulatively considerable adverse effect on CVP contractor service areas.

The DEIS impact analysis discloses both the positive effects of improving the quantity or reliability of water to agricultural, municipal and industrial water users, as well as the on-going adverse effects of the no action alternative on CVP service areas. No changes to the Final EIS are necessary related to socioeconomic impacts in CVP service areas where more water may be delivered.

EI-7 – Bay Delta Conservation Plan Too Speculative to Provide Meaningful Quantitative Cumulative Analysis in SLWRI EIS

During the preparation of the cumulative impact assessment of the SLWRI DEIS, Reclamation carefully considered how to treat various potential future actions and programs consistent with 40 CFR 1508.7. Projects which are included in the SLWRI cumulative effects analysis quantitatively are those that are reasonably foreseeable projects defined as including those with current authorization, secured funding for design and construction, and environmental permitting and compliance activities that are substantially complete (Chapter 2, "Alternatives," Section 2.2, "No Action"). The comments received on the SLWRI cumulative impact analysis correctly identify that the BDCP cumulative effects were evaluated on a qualitative analysis basis rather than a quantitative basis. This response details why Reclamation correctly identified a qualitative methodology for evaluating the BDCP cumulative effects.

The SLWRI DEIS was released in June 2013, before the release of the DEIR/S for the BDCP in December 2013. While a BDCP Administrative DEIR/S was released before the SLWRI DEIS release, Reclamation does not use quantitative information from an Administrative DEIR/S for a cumulative impact analysis due to the very nature of these analyses being in flux at that stage. The December 2013 BDCP DEIR/S evaluates 15 action alternatives, including a No-Action alternative, and a range of 20 potential conservation measures. For the purposes of NEPA, a BDCP preferred alternative was not identified in the December 2013 draft (BDCP DEIR/S Chapter 3 Description of Alternatives page 3-3). In August 2014, it was announced that a partially Recirculated Draft BDCP, EIR/S, and Implementing Agreement will be published in early 2015. Reclamation considers that a selection of any one alternative is speculative at this point in time, as the document will

be recirculated, the analyses may be in flux, and it is unknown if a preferred alternative will be identified for the purposes of NEPA in the 2015 BDCP DEIR/S.

For the purposes of CEQA, DWR's "Preferred Alternative" is Alternative 4 (the proposed BDCP). The December 2013 BDCP DEIR/S acknowledges that, "the preferred CEQA alternative is tentative, and is subject to change as DWR and its partner lead and responsible agencies receive and consider public and agency input on the EIR/S. It is therefore possible that the final version of the BDCP may differ from Alternative 4 as described herein, either because Alternative 4 itself was further refined, because another alternative was determined to be preferable, or because the Lead Agencies, in response to input, developed a new alternative with some features from some existing alternatives and other features from other existing alternatives" (BDCP DEIR/S Executive Summary page 21)."

Commenters state that with the release of the December 2013 DEIR/S for the BDCP, an accurate quantitative evaluation of cumulative effects with regard to the BDCP could feasibly be produced for the SLWRI Final EIS. A NEPA cumulative impacts analysis does not require the consideration of every alternative under consideration for a future action or program. Reclamation agrees that once a BDCP preferred alternative is identified in a ROD, it would be appropriate to consider the cumulative effects of the BDCP and the SLWRI along with other past, present and reasonably foreseeable future projects in either a quantitative analysis if information is available to support such an analysis, or a more detailed qualitative analysis. However, the SLWRI Final EIS is being published in advance of a BDCP ROD.

Additionally, the wide range of BDCP alternatives identified for conveyance alone would be prohibitive of a meaningful quantitative cumulative analysis for the purposes of the SLWRI EIS in the interim. The December 2013 BDCP DEIR/S Executive Summary Section 5.2.2 Operational Components/Scenarios summarizes the complex scenarios that were derived for evaluation of the effects of the physical components of the BDCP's 9 conveyance alternatives. To overlay each of the five SLWRI alternatives on top of each of the 9 conveyance scenarios would yield 45 separate analyses of cumulative effects. This is far beyond the requirements of NEPA.

The Final EIS provides further detail on the qualitative cumulative effects analysis with regard to the BDCP DEIR/S.

33.3.33 Master Comment Responses for Environmental Justice

EJ-1 – Potential Effects to Disadvantaged Communities

Executive Order 12898 on environmental justice requires federal agencies to define the minority and low income environmental justice communities to be analyzed. As discussed in DEIS Chapter 24, "Environmental Justice," Section 24.3.1, “Methods and Assumptions,” for the purposes of the analysis presented in the EIS, a county is considered to have a minority population if its nonwhite population is greater than 50 percent or is meaningfully larger than the general (statewide) nonwhite population. Low-income areas are defined as counties in which the percentage of the population below poverty status exceeds 50 percent, or is meaningfully greater than the general population (average statewide poverty level). Chapter 24, "Environmental Justice," Section 24.3.2, “Criteria for Determining Disproportionately High and Adverse Effects,” also states that data are presented at the county level given the large size of the project impact area comprised largely of rural areas and the fact that localized areas within the counties are not likely to differ appreciably in their minority and low-income population makeup. Although the City of Shasta Lake meets the criteria for a “disadvantaged community,” defined by the State of California, the EIS provides an analysis of environmental justice communities based on the Council of Environmental Quality’s Environmental Justice Guidance under the National Environmental Policy Act, which defines minority and low income populations as those meeting the criteria described above. The City of Shasta Lake’s percentage of minority (nonwhite) residents in 2010 was 13.9 percent, compared to 16.6 percent for the Shasta County as a whole, and the percentage of low-income residents in the City of Shasta Lake was 20.5 percent compared to 15.5 percent for the county as a whole. Thus, the minority and low-income population percentages for the City are similar to the county as a whole, and are well below the 50 percent threshold for percentage of minority and low-income residents and are not meaningfully greater than the comparison population used in the analysis (state of California).

In addition, Chapter 24, "Environmental Justice," Section 24.3.1, “Methods and Assumptions,” has been revised to summarize which areas in the study area are considered to be minority and low income environmental justice communities. Chapter 24, "Environmental Justice," of the DEIS also describes potential impacts that would occur to any of these environmental justice populations. It describes more broadly the economic conditions in the study area, as does Chapter 16, "Socioeconomics, Population, and Housing," in the DEIS. Reclamation has complied with Executive Order 12898 in preparing this DEIS as described in Chapter 24, “Environmental Justice.” Impacts to tribes and their cultural resources are identified in Chapter 24, “Environmental

Justice," as well as in Chapter 14, "Cultural Resources," and the process for defining mitigation measures for any identified adverse impacts is discussed.

Chapter 24, "Environmental Justice," of the DEIS states that the proposed action will have disproportionately high and adverse effects on Native American populations in the vicinity of Shasta Lake and would result in a cumulatively considerable incremental contribution to a significant and unavoidable cumulative impact on Native American populations. See also Master Comment Response CR-1, "Potential Effects to Cultural Resources," Master Comment Response CR-5, "Environmental Justice," and Master Comment Response CR-15, "National Historic Preservation Act Section 106 Consultations."

33.3.34 Master Comment Responses for Regional Economic Impacts

SOCIOECON-1 – Socioeconomic Effects to Shasta Lake Vicinity

Comments were received that relate to potential social and economic impacts to local communities around Lake Shasta from the potential raising of Shasta Dam. As discussed in Chapter 16, "Socioeconomics, Population, and Housing," all alternatives are expected to have an overall short-term beneficial effect on the local economy during construction, including increases in local tax revenues. Long-term recreational visits are also expected to increase following construction, as discussed in Chapter 18, "Recreation and Public Access." In addition, all action alternatives would maintain the existing recreation capacity and distribution around Shasta Lake. Replacement facilities would be of equivalent overall capacity and quality to affected facilities and would provide comparable shoreline access, where applicable. Potential impacts to businesses and residents are also discussed in the Real Estate Appendix. As stated in Chapter 2, "Alternatives," Reclamation will implement commitments to avoid, reduce, mitigate, and/or compensate for adverse socioeconomic and related environmental impacts to the extent practicable, including –but not limited to– compliance with the policies and provisions set forth in the Uniform Relocation Assistance and Real Property Acquisition Policies Act for all relocations. See also Master Comment Response UR-1, "Effects to Water and Wastewater Infrastructure around Shasta Lake," Master Comment Response PLAR-1, "Effects to Private Residences and Businesses," and Master Comment Response REC-1, "Effects to Recreation at Shasta Lake."

SOCIOECON-2 – Effects on Short-term and Long-term Employment

Comments were received relating to the potential short-term and long-term regional employment supported by the potential raising of Shasta Dam. Estimated potential employment and personal income effects supported by the proposed action/project modification, as described in

the DEIS in Chapter 16, “Socioeconomics, Population, and Housing,” include short-term employment related to construction activities and long-term employment related to increased average annual agricultural production.

Direct construction employment estimates range from 300 to 360 annual jobs over the anticipated construction period (4.5 to 5 years) for the action alternatives. Indirect and induced jobs related to construction activities were estimated through Impact Analysis for Planning (IMPLAN) modeling. IMPLAN is a commercially-available system of software and data commonly used to perform economic impact analysis and was selected based upon Reclamation standard practices, and input from subject matter experts. Potential indirect jobs in various construction-related support industries range from 390 to 470 annual jobs, and potential induced jobs, because of increased household spending, range from 600 to 710 annual jobs for project alternatives. Individuals to fill these jobs are expected to be drawn predominantly from the local community and region. These jobs are expected to provide important but temporary employment opportunities to many unemployed construction workers in the primary study area.

The Statewide Agricultural Production (SWAP) model was used to determine the potential effects of the action alternatives on CVP and SWP agricultural users. The SWAP model is a regional economic model of irrigated agricultural production that simulates the crop-related decisions of agricultural producers (farmers) in the Central Valley of California. SWAP is the most current version of a series of California agriculture production models developed by researchers at the University of California at Davis in collaboration with DWR, and is being used in several ongoing studies of California water projects and operations. SWAP does not estimate the number of additional agricultural positions that would be supported as a result of improved irrigation, but the resulting increase in water reliability and availability from action alternatives would have the potential to strengthen and extend the existing growing season in the CVP and SWP service areas. Although the model’s income-related projections were generally used to determine effects on business and industrial activity, the overall change in business net income (or profits) is a good indicator for potential changes in employment opportunities in affected sectors. Estimated increases in net average annual agricultural income, documented in Modeling Appendix, range from $1.5 million to $6.1 million for the Alternatives.

33.3.35 Master Comment Responses for Technical Analyses

TA-1 – Interrelationship Between Shasta Dam Operations, San Joaquin River Flows, and Delta Exports

Comments were received on the relationship of San Joaquin River flows, Delta exports, and Shasta Reservoir operations.

Operations modeling was performed using the CalSim-II CVP/SWP simulation model, the best available tool for predicting system-wide water operations throughout the Central Valley. Details on the CalSim-II model and the assumptions included in all simulations can be found in the Modeling Appendix, Chapter 2, "CalSim-II." As described in the Modeling Appendix, Chapter 2, "CalSim-II," the CalSim-II model includes an Artificial Neural Network (ANN) that is based on the DSM2 simulation model, the best available model of the hydrodynamic and salinity conditions in the Delta. DSM2 is also described in the Modeling Appendix Chapter 7, "Delta Hydrodynamic Model." In the ANN, as in DSM2, inflows from the Sacramento River, San Joaquin River, East Side Streams and ocean tides and the CVP/SWP exports from the South Delta affect flows and salinities throughout the Delta.

Tracking the fate of individual water molecules is not possible using these modeling tools, so delineating the exact relative contribution of Sacramento and San Joaquin River water to exports and meeting Delta standards is also not possible. However, mass balance analysis of CalSim-II results shows that Sacramento River water is frequently exported, particularly in July-December when exports are relatively high and San Joaquin River flows are relatively low. The citation provided ("Using Particle Tracking to Indicate Delta Residence Time") also shows that Sacramento River water passing by Freeport is exported.

The flow and salinity standards do not specify the source of the water molecules at any specific location only that the molecules that are at that location meet the standards and provide the desired level of protection to the ecosystem. All of this means that additional Sacramento River inflow from Shasta Reservoir enlargement allows for increases in exports while still meeting all applicable flow, salinity, and stage requirements at various locations throughout the Delta, maintaining the level of protection implicit in the formulation of the standards.

33.3.36 Master Comment Responses for Transportation

TRANS-1 – Potential Construction-Related Effects to Roadways and Traffic Congestion

Several comments reflect concerns regarding potential construction-related impacts to roadways and traffic congestion.

As discussed in Chapter 2, "Alternatives," environmental commitments for the action alternatives include developing and implementing a construction management plan to avoid or minimize potential impacts on public health and safety during project construction. The DEIS Chapter 20, “Transportation and Traffic,” Section 20.3, “Environmental Consequences and Mitigation Measures,” discusses the effects of the action alternatives on local roads and bridges. As described in the DEIS, there are potentially significant impacts from each of the action alternatives on traffic, roadway integrity, local access and emergency access (Impacts Trans-1, Trans-2, Trans-4 and Trans-5). Mitigation is proposed for these impacts and is listed in Table 20-3, “Summary of Mitigation Measures for Transportation and Traffic” under Chapter 20, “Transportation and Traffic,” Section 20.3.5, “Mitigation Measures.”

Mitigation for these impacts (Impacts Trans-1, Trans-2, Trans-4 and Trans-5) are summarized as follows:

- Mitigation Measure Trans-1 – Prepare and Implement a Traffic Control and Safety Assurance Plan
- Mitigation Measure Trans-2 – To Reduce Effects on Local Access, Implement Mitigation Measure Trans-1
- Mitigation Measure Trans-4 – To Reduce Effects on Emergency Access Implement Mitigation Measure Trans-1
- Mitigation Measure Trans-5 –Identify and Repair Roadway Segments Damaged by the Project

Implementation of these mitigation measures would reduce the associated impacts to a less-than-significant level. Mitigation measures were not needed and thus not proposed for identified impacts: Trans-3, Trans-6, Trans-7, Trans-8, Trans-9 and Trans-10.

As described in Reclamation’s NEPA Handbook, Reclamation is obligated to fulfill and appropriately fund all monitoring and mitigation measures that it commits to implementing in its final decision. For NEPA documents, these commitments generally appear in the ROD and other decision documents.

33.3.37 Master Comment Responses for Water Quality

WQ-1 – Remediation of Abandoned Mines in the Shasta Lake Area

Comments were received related to impacts and mitigation for potential effects of inundating abandoned mines in the Shasta Lake area, including Golinsky, Mammoth, Greenhorn, Willow Creek, and the Bully Hill complex.

One suggested abandoned mine, the Golinsky mine complex, was determined by Reclamation to be outside of the surface erosion analysis area, and is documented in the Geologic Technical Report, Chapter 1, "Affected Environment," Section 1.1.4, "Mineral Resources," "has been subject to extensive remediation to reduce the discharge of toxic mine waste and acidic waters to Shasta Lake." Mammoth, Greenhorn and Willow Creek abandoned mines were noted to lack any notable abandoned mine features and no evidence of acid drainage.

The Bully Hill mine complex (Bully Hill, Copper and Rising Star mines) was found to be within the analysis area. A waste pile of approximately 7,300 cubic yards was the abandoned mine feature identified at the Bully Hill mine complex that would be subject to inundation for longer durations annually. This was documented by Reclamation in Chapter 7, "Water Quality," Section 7.1.4, "Metals," lines 3 through 15 "...these areas are a documented source of metals and continue to be subject to an abatement order issued by the CVRWQCB..." For information on proposed remediation activities at the Bully Hill mine complex, please see DEIS Chapter 7, "Water Quality," Section 7.3.5, "Mitigation Measures," Mitigation Measure WQ-6, "Prepare and Implement a Site-Specific Remediation Plan for Historic Mine Features Subject to Inundation in the Vicinity of the Bully Hill and Rising Star Mines." The erosion has been accounted for in the surface erosion analysis and documented in the "other" category under dominant erosion type in Table 2-6 on page 2-6 of the Geological Technical Report.

33.3.38 Master Comment Responses for Climate Change

CC-1 – Climate Change Uncertainty and Related Evaluations

Comments were received related to the uncertainty of the effects of the alternatives on climate change (e.g., GHG) and how climate change may affect the alternatives, including how climate change may impact reservoir storage in the future with and without enlarging Shasta Dam.

The effects of the action alternatives on climate change are described in Chapter 5, "Air Quality and Climate." This chapter describes both the GHG emission effects of the action alternatives, and the effects of the action alternatives when considering past, present and future GHG emissions in the region and globally.

As described in DEIS Chapter 3, "Environment and Environmental Consequences," Section 3.2.9, "Cumulative Effects," each resource area qualitatively evaluates the cumulative effects of SLWRI action alternatives combined with predicted effects of climate change. The Climate Change Modeling Appendix provides a summary of global climate forecasts and a discussion of the implications of climate change for California water resources. This can be found in the Climate Change

Modeling Appendix in Chapter 1, "Introduction," Chapter 2, "Summary of Previous Climate Change in the Study Area," and the first part of Chapter 3, "Potential to Achieve Water Supply Reliability Objective Under Climate Change." These discussions provide the basis for the qualitative cumulative effects evaluations in each resource area chapter.

The latter portion of the Climate Change Modeling Appendix, including the second part of Chapter 3, "Potential to Achieve Water Supply Reliability Objective Under Climate Change," and Chapter 4, "Potential to Achieve Anadromous Fish Survival Objective Under Climate Change," documents a sensitivity analysis of the potential for action alternatives to address primary project objectives of increasing water supply reliability and anadromous fish survival under climate change. This includes quantitative analyses of climate change for selected comprehensive plans on resource areas. The climate change sensitivity analyses are based on different analytical techniques than are used to develop the impacts documented in the main body of the DEIS. Accordingly, quantitative results presented in the appendix cannot be directly compared to results presented in the direct and indirect effects sections for each resource area chapter (DEIS Chapters 4 through 25).

The quantitative climate change evaluations included in the Climate Change Modeling Appendix were conducted for sensitivity analysis purposes only, and were not the basis for qualitative cumulative effects analyses in each resource area chapter. Further, results from the climate change sensitivity analysis were not used in the quantitative or qualitative direct and indirect evaluations in each resource area chapter. The SLWRI action alternatives described in the DEIS propose various magnitudes of the same basic physical features, increased storage at Shasta Lake, and all would be expected to react similarly to future climate changes. Based on the assumption that if an alternative showed a positive or negative trend compared to without-project conditions, all alternatives would show similar trends with slightly different magnitudes. Because this analysis was intended for sensitivity purposes only and due to the uncertainty inherent in climate change scenarios, evaluation of all alternatives was not deemed justified.

CC-2 – Climate Change Projections

Comments were received related to the specifics of the climate change analysis. The most recent climate change projections include uncertainty in both future global socioeconomic conditions effecting atmospheric greenhouse gases and limitations in the current global climate models (GCM) and downscaling methods. As documented in the Climate Change Modeling Appendix these uncertainties were simulated by 112 different climate change scenarios assumed to be reasonably representative of the potential range of 21st century climate conditions. To allow reasonable evaluation of climate change impacts these

projections were statistically combined into five ensemble-informed projections representative of a wide range of potential future climatic conditions. This approach offers the advantage of reducing uncertainties associated with individual GCM results while capturing most of the range of potential future climatic conditions in only five projections. This also has the advantage of reducing the computational effort necessary to characterize uncertainty to a level reasonable for a robust sensitivity analysis. Although the climate change sensitivity analyses did not include re-operation or optimization of system operations of the project, any climate change adaptation measures would only improve conditions further. Such measures would be expected to provide additional benefit to the anadromous fishery and further reduce any potential increase in jeopardy to threatened and endangered species that might occur due to climate change.

33.3.39 Master Comment Responses for CVPIA

CVPIA-1 – Central Valley Project Improvement Act Firm Level 2 and Incremental Level 4 Refuge Water Supplies

Comments were received related to addressing Incremental Level 4 (IL4) water in the EIS. The commenters are correct that (IL4) water should be addressed in the EIS. The Final EIS has been revised to further describe both the relevant provisions in CVPIA (portions of Section 3406(d)) and actions taken to implement those provisions.

Annual acquisitions of IL4 water will continue to vary from year to year, depending on annual hydrology, water availability, water market pricing, and funding[6]. Therefore, it would be speculative to predict or assume quantities and locations of annual IL4 acquisitions from willing sellers. Without that information, it could not be incorporated into the CalSim-II modeling assumptions or other analyses. It would not be possible to quantitatively assess effects of the action alternatives on deliveries of IL4 water. Effects would instead need to be discussed qualitatively.

As all of the action alternatives would increase water supply reliability in comparison to the No-Action Alternative, it could be argued that the effect would be either "no impact" (no change in Reclamation's ability to find willing sellers) or "beneficial" (the increased water supply reliability could provide more opportunity for Reclamation to find willing sellers), thereby requiring no mitigation for any of the action

[6] Each year, Reclamation strives to provide as much IL4 water as possible. Section 3406 (d)(2) of the CVPIA specifies that Reclamation must acquire this IL4 water "…through voluntary measures such as water conservation, conjunctive use, purchase, lease, donations, or similar activities, or a combination of such activities which do not require involuntary reallocations of project yield." CVPIA Section 3406 (d) in its entirety is available at https://www.usbr.gov/mp/cvpia/title_34/3406.html.

alternatives. The Final EIS has been revised to describe the potential qualitative effects of the action alternatives on deliveries of IL4 water.

Refuge Water Supply Information and Analyses in DEIS DEIS Chapter 6, "Hydrology, Hydraulics, and Water Management," Section 6.2.1, "Regulatory Framework, Federal," describes "…firm water supplies for Central Valley wildlife refuges…" as one of the changes mandated by CVPIA.

As described in Chapter 6, "Hydrology, Hydraulics, and Water Management," Section 6.3.2, "Criteria for Determining Significance of Effects," of the DEIS, refuges are subject to shortages according to water availability and their geographic location; because of conveyance constraints, south-of-Delta refuges have a lower degree of reliability than north-of-Delta refuges.

As described in Chapter 6, "Hydrology, Hydraulics, and Water Management," Sections 6.3.3, "Direct and Indirect Effects," and 6.3.4 "Mitigation Measures," of the DEIS, no mitigation measures are proposed for the action alternatives because no potentially significant impacts have been identified (Impact H&H-9 "change in deliveries to north-of-Delta CVP water service contractors and refuges"). Impact H&H-10 ("change in deliveries to south-of-Delta CVP water service contractors and refuges") could result in beneficial impacts, so no mitigation is needed.

Detailed descriptions of the CalSim-II model, the modeling methodology used in evaluations, and key assumptions are provided in the DEIS Modeling Appendix, Chapter 2, "CalSim-II." Additional information on the analysis and modeling results is provided in the Physical Resources Appendix, "Hydrology, Hydraulics, and Water Management Technical Report" of the DEIS.

CVP Contracts SLWRI does not include the consideration or evaluation of new water service contracts or agreements; it reflects existing water service contracts and agreements.

Compliance with Existing Laws and Regulations SLWRI action alternatives do not supersede existing laws or regulations and does not exempt any actions from compliance with applicable laws, including NEPA or ESA. The Federal, State, and local regulatory framework is generally described in Chapter 3, "Considerations for Describing Affected Environment and Environmental Consequences," Section 3.4, "Regulatory Framework," of the DEIS. Chapters 4 through 25 contain more detailed discussions of the "Regulatory Framework" by resource area. In addition, Chapter 26, "Other Required Disclosures," further describes the Federal and State laws, rules and regulations, Executive

Orders, and compliance requirements that may be required if an alternative is selected for implementation.

Revisions to the Final EIS The Final EIS has been revised to clarify CVPIA Section 3406 and the Refuge Water Supply Program. Chapter 3, "Considerations for Describing Affected Environment and Environmental Consequences," Section 3.2.9, "Cumulative Effects," has been revised to incorporate the following under the "Qualitative" heading.

CVPIA Section 3406. Fish, Wildlife, Improved Water Management & Conservation CVPIA Section 3406 (d) states that "…the Secretary [of the Interior] shall provide, either directly or through contractual agreements with other appropriate parties, firm water supplies of suitable quality to maintain and improve wetland habitat areas on units of the National Wildlife Refuge System in the Central Valley of California; on the Gray Lodge, Los Banos, Volta, North Grasslands, and Mendota state wildlife management areas; and on the Grasslands Resources Conservation District in the Central Valley of California" (CVPIA 2013).

Refuge Water Supply Program The goal of the Refuge Water Supply Program (RWSP), which consists of three important components – water acquisitions, conveyance, and facilities' construction, is to ensure that all CVPIA-identified wetland habitat areas (refuges), annually receive water of specified quantity, of suitable flow rate and timing, and suitable quality to support their wetland and aquatic environments. The RWSP serves 19 refuges in the Central Valley.

The RWSP is administered and implemented by Reclamation in close collaboration with the USFWS, Region 8. Reclamation and the USFWS also work cooperatively with the CDFW, Grassland Water District, and CVHJV in implementing the RWSP.

The RWSP delivers two water types defined as Level 2 (L2) water and Incremental Level 4 (IL4) water.

- L2 is the amount of water required for minimum wetlands and wildlife habitat management based on historic average annual deliveries before 1989. Reclamation is required to provide full L2 water supplies annually. The L2 annual water delivery target is 422,251 acre-feet, including 26,007 acre-feet of replacement water. Replacement water was originally provided by tailwater and groundwater but is now included in L2 water supplies due to water quality concerns.

- IL4 water is the difference between L2 and Full Level 4 (L4) water supplies; it equals 133,264 acre-feet.

Full L4 is the total annual amount of water identified for each refuge in CVPIA as required for optimum wetlands and wildlife habitat development and management. The Full L4 water delivery target for the 19 refuges is 555,515 acre-feet and is met when L2 and IL4 water targets are met in full.

Each year, Reclamation strives to provide as much IL4 water as possible. The CVPIA specifies that Reclamation must acquire this IL4 water "…through voluntary measures such as water conservation, conjunctive use, purchase, lease, donations, or similar activities, or a combination of such activities which do not require involuntary reallocations of project yield" (CVPIA 2013). The amount of IL4 water acquired varies from year to year, depending on annual hydrology, water availability, water market pricing, and funding.

To ensure reliability for refuge managers, Reclamation entered into long-term water supply contracts with the three refuge managing agencies: CDFW, USFWS, and GWD. These contracts have performance periods of 25 years and are renewable, representing Reclamation's obligation under CVPIA to provide identified quantities of water to certain refuges in the Central Valley.

From Fiscal Year 2002 – 2013, the RWSP has delivered an annual average of 383,603 acre-feet of L2 water (91 percent of the 422,251 acre-feet target) and 66,588 acre-feet of IL4 water (50 percent of the 133,264 acre-feet target) (CVPIA 2013). (Fiscal Year 2002 was the first year that CVPIA mandated Full L4 deliveries for all refuges (CVPIA 2013)).

In addition to the above clarification in Chapter 3, "Considerations for Describing Affected Environment and Environmental Consequences," revisions have been made to the following portions of the Final EIS and related appendices:

- Final EIS Chapter 6, "Hydrology, Hydraulics, and Water Management," Section 6.3.3, "Direct and Indirect Effects"

- Final EIS Chapter 11, "Fisheries and Aquatic Ecosystems," Section 11.3.3, "Direct and Indirect Effects"

- Final EIS Chapter 12, "Botanical Resources and Wetlands, " Section 12.3.4, "Direct and Indirect Effects"

- Final EIS Chapter 23, “Power and Energy,” Section 23.3.3, “Direct and Indirect Effects”
- Final Plan Formulation Appendix, Chapter 1, “Introduction”
- Final Modeling Appendix, Chapter 2, “CalSim-II”
- Final Physical Resources Appendix, Hydrology, Hydraulics, and Water Management Technical Report, Chapter 1, “Affected Environment”

33.4 List of Commenters

Table 33.4-1 lists all agencies, organizations, and individuals who submitted comments on the DEIS and who commented on that document during the three public hearings.

Table 33.4-1. List of Commenters on Draft Environmental Impact Statement

Elected Officials
California State Senator Jim Nielsen
Federal Agencies
U.S. Environmental Protection Agency, Region IX
U.S. Army Corps of Engineers
U.S. Forest Service
U.S. Department of the Interior, Fish and Wildlife Service, Sacramento Fish and Wildlife Office
Department of Energy, Western Area Power Administration
Tribes
Confederated Tribes of Coos, Lower Umpqua & Siuslaw Indians
Santa Ynez Band of Chumash Indians
United Auburn Indian Community of the Auburn Rancheria
State Agencies
California Department of Transportation
Central Valley Flood Protection Board
Central Valley Regional Water Quality Control Board
Department of Fish and Wildlife
Delta Stewardship Council
Department of Water Resources
Sacramento River Conservation Area Forum
Shasta Regional Transportation Agency
State Water Resources Control Board

Table 33.4-1. List of Commenters on Draft Environmental Impact Statement (contd.)

Regional and Local Governments and Agencies
Contra Costa Water District
City of Shasta Lake
East Bay Municipal Utility District
Grassland Water District
Mountain Gate Community Services District
City of Redding
Redding Electricity Utility, City of Redding
Shasta County Board of Supervisors
Santa Clara Valley Water District
Stockton East Water District
San Luis & Delta Mendota Water Authority
State Water Contractors
Special Interest Group
AquAlliance
Butte Environmental Council
CalTrout
Campbell Creek Homeowners Association
California Farm Bureau Federation
Citizens for Clean Air
California Wilderness Coalition and Friends of the River
EMA, Inc.
Environmental Protection Information Center
Environmental Water Caucus
Friends of the Delta Watershed
Friends of the River
International Organization for Self-Determination and Equality
Dale La Forest & Associates
Lakehead Community Development Association
Lakeshore Heights Municipal Water Company
Northern California Power Agency
Natural Resources Defense Council
Northstate Women’s Health Network
Pacific Forest Trust
Pacific Gas & Electric Company
Porgans & Associates
Plumbers and Pipefitters Local Union #228
Rotary Club of Redding
Rivers for Change

Table 33.4-1. List of Commenters on Draft Environmental Impact Statement (contd.)

Special Interest Group (contd.)
Shasta County Coordination Committee
Salt Creek Summer Homesites Association
Shasta Lake Business Owners Association
Sacred Land Film Project
Sacramento River Preservation Trust
Save The California Delta Alliance
The California Parks Company
The Nature Conservancy
The River Exchange
Individual
Abbe, Jessica
Adomite, Laurie
Adomite, Laurie
Alderson, George
Alexander, Charles W.
Allinder, Bruce
Ambrogi, Karen
Anderson, Donna and Howard
Anderson, Kim Noreen
Anger, Robert
Bacon, Julie
Bahr, Larry
Ball, Jeff
Barrett, Gene
Batchelder, Philip
Battenden, Marlene
Beal, Marc
Beck, C.A.
Beebe, Gordon
Behm, Harriet
Biggins, Harry
Bishop, Steve and Dotty
Bitner, Patricia
Blomquist, Robert and Therese
Boudefoua, Ferhat
Brennan, Brien
Brennan, Dianne

Table 33.4-1. List of Commenters on Draft Environmental Impact Statement (contd.)

Individual (contd.)
Brinkhurst, Jim and Cyndi
Brown, Molly Young
Brown, Richard M. and Estella Dee
Burger, Bitsa
Busby, Lois
Buxton, Nick
Byron, Curtis – Coram Ranch
Byron, Curtis and Debbie – Coram Ranch
Cassano, Eric
Castleberry, Robert
Ceragioli, James S.
Chen, Allen
Chetron, Avram
Chitewere, Tendai
Cipra, Michael
Clarke, JoAnne
Clement, Melanie
Clement, Rosemary
Coffey, Karen
Coleman, Judy
Collins, Michele
Cooper, Barbara
Corley, Jane
Correia
Courtier, Christophe
Crockett, Cynthia
Crosland, Richard
Dadigan, Tom
Darling, Jeff
Davison, Matthew B.
DeGroft, Albert
Denison, Lou Anna
Dinh, Zack Haison
Donaldson, Michelle
Doolittle, Will
Drake, Sandra
Drew, Mary Meredith

Table 33.4-1. List of Commenters on Draft Environmental Impact Statement (contd.)

Individual (contd.)
Eargle, Dolan
Ediaston, Mayreen – Retired Teachers
Emmons, John-Eric
Erika Giesen
Etter, John
Fagerskog, Carl
Fahner, Fred
Ferris, Jeanne
Filipelli, Deborah
Fitch, Steve
Floyd, Kim F.
Fortino, Robert, S.
France, Jeanne
Freeman, Kyri
Freeman, Robin
Frost, Kelly
Garabedian, Hrach
Garcia, Jesus
Garcia, Nichelle
Gardner, Nick
Gibbs, Dinah
Gill, Barbara
Gill, Joshua
Gilmartin, Steve
Goetz, Robert
Goff, Charles
Goggins, Alan
Goodman, Brenda
Gowan, Jeffrey
Gowan, Jnana
Graham, Nathalie
Granger, Laurie
Green, Sue
Gregor, Dorothy D.
Grey, David – Tsasdi Resort

Table 33.4-1. List of Commenters on Draft Environmental Impact Statement (contd.)

Individual (contd.)
Guerrero, Daniel
Gurries, Richard F. and Laurie L.
Hankins, Don
Harrington, Snake
Harte, Mary
Hauck, Jessica
Hazelton, S.
Hazelton, Scott & Laura
Hebert, Allene
Hekkelman, Jamie
Hensher, Cassandra
Hesseldenz, Tom – Tom Hasseldenz & Associates
Hild, Art
Hill, Zack
Hoaglund, Judy
Hodson, Brianne
Hollister, Sidney, J.P.
Holmes, Joanna
Holt, Buford
Holtzclaw, John
Hunrichs, Paul G.
Hunter, Cliff
Imhof, Sheena
Irvine, Roblee and Al
Israel, Debbie
Jerry
Jewell, Aaron
Jones, May
Joo, Misa
Joplin, Catherine
Kaeding, William
Kaljian, Mary Grace
Kass, Sarah
Keel, Dylan
Keith, Christie
Kendall, Enid and Arthur

Table 33.4-1. List of Commenters on Draft Environmental Impact Statement (contd.)

Individual (contd.)
Kern, Barbara
Kimberly Anne
Kirkman Campbell, Kathryn
Kisling, Mardy
Kisling, Tom and Mardell
Kisling, Tom and Mardi
Klehr, Gary
Kline, Stacy
Kline, Stacy
Koenig, Ruth
Kohen, Eitam
Kohler, Richard A.
Kossack, David S., PhD.
Kovacs, Christine
Kuelper, Carol
Kurcab, Kim
Lachman, Wesley
Lagrone, Avis
Lagrone, Desiree
Lake Shasta Caverns – Doyle, Matthew
Lakeshore Inn & RV – Marshall, Ross & Charlotte H.
Lamaggiore, Desiree
Lambert, Harmony
Larcade, Denise
Larcade, Jimmie
Lee, Erin
Lee, Roger and Sherri
Lehman, Audra
Lewis, Graham
Li…, Kate B.
Linarez, Karen
Lincke, Jack
Lind, Pat
Lindley, Catherine
Linney, Doug
Livingston, John

Table 33.4-1. List of Commenters on Draft Environmental Impact Statement (contd.)

Individual (contd.)
Lorenzetti, Dennis
Luevano, Annarae M.
Lynn, Sue
Mack, Callie
MacNeil, David
MacNeil, Debbie
Manning, Joan
Marin, Gerardo O.
Marquis, Philip G.
Martin, Ernest D.
Martin, Shirley
Martinez, David
Matson, Corinne
McCarthy, Linda
McDonald, Rob
McKee, Richard
McLaughlin, Michael
McNames, Randall
McPherson, Melanie
McVarish, Linda
Messina, Stefanie
Miesse, William
Mitchell, Herbert W.
Morgan, Pam
Moss, Paul
Muirhead, J. Fraser
Mulvey, Roxann
Mungol, Indra R.
Murphy, David
Narbutovskih, Anna
Nelson, Jeff
Newman, Marc
Nishio, John
Nitta, Alex
Nor Cal Beat – McDonald, Rob
Northern California Anglers Association – Bacher, Dan

Table 33.4-1. List of Commenters on Draft Environmental Impact Statement (contd.)

Individual (contd.)
O'Connor, Sorca
Ohalloran, Elizabeth
Oliveira, Mauro
Oselett, Barry
Oyung, Frank
Packers Bay Marina – Brooks, Kristine
Palmer, Gracious A.
Palmer, Penny
Pantalone, Al
Pantalone, Arlene
Parks, Katie
Parrinello, Will
Pearce, John
Pedersen, Karen
Penberthy, Gary
Perkins, Anne Raleigh
Perkins, Lowell S.
Perkins, Michelle
Petraitis, Jeannette
Pettit, Joseph
Pfeiffer, Jeanine
Phelps, Virginia and Ed Smith
Philip, Simon
Powell, Charles
Public Water News Service – Wilson, Burt
Quiros, Marcie
Reddin, Roy
Reid, Matt
Rencountre, Rebecca
Reynolds, Gary
Richard, Silke
Richards, Linda
Ricks, Mike
Riverview Golf & Country Club – Anderson, Don
Roderick, Steve
Rosenthal, Michael

Table 33.4-1. List of Commenters on Draft Environmental Impact Statement (contd.)

Individual (contd.)
Sagan, Minnie
Sally, Debra
Salus, Penny
Sampson, Cathy & Dan
Samuels, Linda
Sanders, Iris
Schaafsma, William R.
Schanuth, Fusia
Schaser, Kay
Schenck, Alan
Schillo, Noah
Seaborg, David
Searle, Richard C.
Sechrengost, Maureen
Shanafelt, Callie
Shasta Lake Resorts LP – Howe, Rich
Shasta Marina Resort – Harkrader, John and Anna
Shetrawski, Heather
Shufelt, Becky
Silver, Dan
Silverthorn Resort – Reha, Michael
Sims, Sharon
Smith, Dr. Randall
Smith, Paul
Smith, Randall
Spears, Connie
Specht, Fred
St. Amant, Tony
Stapleton, Michael
Steele, Richard & Beverly
Stellar, Joni
Stenberg, Anna Marie
Stephenson, Betty
Stern, Herb
Stevens, Raven
Stokes, John

Table 33.4-1. List of Commenters on Draft Environmental Impact Statement (contd.)

Individual (contd.)
Stone, Jeffrey
Strand, Heidi
Straub, Carolyn
Su, Catherine
Sugarloaf Cottages Resort – Jones, Harold
Sujay G
Sullivan, Terrie
Sutton, Alisha
Svoboda, Deborah
Swan, Narim
Swiecicki, Atava Garcia
Switzky, Joshua
Sybert, Michael and Marguerite
Taaffe, Michael
Takaro, Mark
Tanner, Tammey
Thomas, Roy
Thompson, David
Thompson, Jon
Thompson, Sarah Glenn
Thorvund, Sarah
Thrasher, Dianna
Tollgaard, Alden S.
Tossberg, Ross
Townsley, Patricia
Treadway, Frank D.
Tsasdi Resort
United Tribe of Northern California, Inc., Wintoon-Wintu-Wintun
Unknown (D-BSW)
Unknown (D-JIM)
Unknown (D-MIUS)
Unknown (D-PAL)
Van Ry, Diana and Allan Tilton
Vandrack, Jason
Veal, Chris
Voorhees, Julia Catherine

Table 33.4-1. List of Commenters on Draft Environmental Impact Statement (contd.)

Individual (contd.)
Voss, Mike and Katie
Wade, Russ
Wagner, Margret and Fritz Griener
Walicki, Joe
Walker, Thomas
Ward, Jill
Watada, Robert
Waugh, Alan
Webb, Loraine
Weidert, Carl
Weidert, Carl L. and Mary Martha
Wilkens, Frank
Williams, Jeannette
Williams, Peggy
Winnemem Wintu Tribe – Fuss, Eddy
Winnemem Wintu Tribe – Volker, Stephan C.
Wolf, Vuku
Woodard, Jessica
Woodcock, Charlene
Wrisley, Gregg
Yardley, Braden
Yowell, Joyce
Zachary, Valerie
Public Hearing, Redding, California September 10, 2013
Brown, Curtis
Burgin, Greg
Cassano, Eric
California Water Impact Network and California Environmental Water Caucus – Stokely, Tom
Davison, Matt
Martinez, David – Winnemem Wintu Tribal Member
Farr, Larry – Mayor of the City of Shasta Lake
Evans, Steve – Friends of the River
France, Jeanne – Winnemem Wintu Tribal Member
Gardener, Nick
Harral, Jerry

Table 33.4-1. List of Commenters on Draft Environmental Impact Statement (contd.)

Public Hearing, Redding, California September 10, 2013 (contd.)
Holt, Buford
Franklin, Robert – Hoopa Valley Tribe (senior hydrologist)
Horkey, Sue
Joplin, Catherine
Kravitz, Kenwa – Winnemem Wintu Cultural Museum
Leavitt, Colleen
Leigh, Craig
Malone, Linda
Marek, Ed
McNeil, Walt
Mundt, David
Preston, Michael
Rider, Rex
Schappell, Bill – District 4
Jones, Harold – Sugarloaf Cottages Resort
Seely, Geenie
Sisk, Caleen – Chief of Winnemem Wintu Tribe
Doyle, Matt – Shasta Lake Business Owners Association
Harkradr, Anna – Read by Michael Tichera from Shasta Marina Resort
Wade, Russ
Watkins, Greg – Councilman of the City of Shasta
Williams, Peggy
Public Hearing, Sacramento, California September 11, 2013
Evans, Steve – Friends of the River
MacNeil, Steve
Public Hearing, Los Banos, California September 12, 2013
No Comments
Comments Submitted After The Deadline
Caporale, John
Esselen Tribe of Monterey County – Brennan, John Polomo
Horne, Adele
Kampa, Richard
Silvers, Dean

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33.5 Comments from Elected Officials and Responses

This section contains copies of comment letters (and any attachments) from the elected officials listed in Table 33.5-1. As noted previously, each comment in the comment letters was assigned a number, in sequential order (note that some letters may have more than one comment). The numbers were then combined with an abbreviation for the official (example: NIEL-1).

Responses to the comments follow the comment letters, and are also numbered, corresponding to the numbers assigned in the letters. The letters and associated responses are sorted alphabetically by abbreviation and appear in this section in that order.

Table 33.5-1. Elected Officials Providing Comments on Draft Environmental Impact Statement

Abbreviation	Elected Official
NIEL	California State Senator Jim Nielsen

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33.5.1 California State Senator Jim Nielsen

NIEL

CAPITOL OFFICE
STATE CAPITOL
SACRAMENTO, CA 95814
(916) 651-4004

ROCKLIN DISTRICT OFFICE
5808 STANFORD RANCH ROAD
SUITE 720
ROCKLIN, CA 95765
(916) 435-0744

CHICO DISTRICT OFFICE
2653 FOREST AVENUE
SUITE 110
CHICO, CA 95928

California State Senate

COMMITTEES
GOVERNMENTAL ORGANIZATION
VICE-CHAIR
BUDGET & FISCAL REVIEW
HEALTH
INSURANCE
VETERANS AFFAIRS

SENATOR
JIM NIELSEN
FOURTH SENATE DISTRICT
REPUBLICAN CAUCUS WHIP

September 25, 2013

Ms. Katrina Chow, Project Manager
Bureau of Reclamation
2800 Cottage Way, MP-720
Sacramento, CA 95825-1898

Subject: Public comment regarding DEIS of Shasta Dam Raise

To whom it may concern:

NIEL-1 I am writing to submit comments in regard to U.S. Bureau of Reclamation's (bureau) Draft Environmental Impact Statement (DEIS) on the Shasta Lake Water Resources Investigation (SLWRI) study examining the impacts of raising Shasta Dam. As a longtime supporter of increasing Northern California's surface water storage capacity, I appreciate that the bureau has laid out plans to raise this dam crest.

NIEL-2 Inasmuch as the state's water needs continue to grow and the climate continues to be unpredictable, the bureau appropriately designates that a primary objective of increased surface water storage is to "increase supply and supply reliability for agriculture, municipal and industry, and to help meet current and future water demands." Raising the crest of the dam will provide a much-needed upgrade to a structure that, over its half-century lifespan, has seen the population it serves double from 20 million Californians to 38 million.

NIEL-3 Secondary goals that were necessarily identified by the bureau include improved water quality, flood management, expanded hydropower generation, and enhanced recreation.

NIEL-4 Of the five plans, three proposals (Comprehensive Plans 3, 4 and 5) call for a maximum 18.5 foot raise of the crest—which would effect a full pool increase of 20.5 feet and a capacity increase of 634,000 acre-feet. I am encouraged that the SLWRI found that an 18.5 foot raise would be "economically justified" and achievable, although each proposal has a different main focuses—some of which are more critical to the benefit of our state.

NIEL-5 While CPs 3, 4 and 5 do address the "secondary planning objectives," it is only CP3 which addresses agricultural water supply reliability as a key point of "focus." Unfortunately, CP3 does not boost water reserves for municipal and industrial (M&I) deliveries; M&I reserves for dry years are necessarily accounted for in CP5. Those are both objectives I would like to see met in the official proposal.

NIEL-6 Additionally, it is my hope that the official proposal will expand findings on the process for managing the effect on private property holdings; in instances when eminent domain is applied, there must be assurances that property owners are properly compensated (taking into account all related expenses accrued, even those not necessarily required under state law, such as moving costs). I am also

NIEL-7 concerned about the impact on the existing marinas, boat ramps, resorts, campgrounds and trails; I would like to see further exploration of the impact on recreational fixtures and use along the lake.

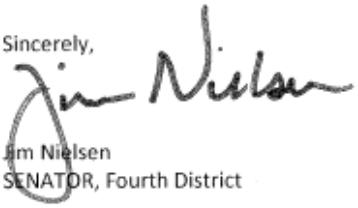
NIEL-8 Similarly, the final proposal should include procedures for relocating local roads and bridges.

NIEL-9 I am pleased that the bureau is considering the dam expansion. I believe that this undertaking is an investment that will provide gains far exceeding the $1.2 billion price tag. The extra water storage

NIEL-10 capacity would advantage Californians statewide, from urban water users to farmers to ratepayers benefitting from increased hydroelectric generation. And while our state needs even more surface water storage than is accounted for by this proposal, this is a realistic first step.

Thank you for your consideration of my comments. If you have any questions about this matter, do not hesitate to contact me.

Sincerely,



Jim Nielsen
SENATOR, Fourth District

Responses to Comments from California State Senator Jim Nielsen

NEIL-1: Thank you Senator Nielsen for your comments on the DEIS and your support of the proposed action.

NEIL-2: Please refer to Master Comment Response GEN-1, "Comment Included as Part of the Record."

NEIL-3: Please refer to Master Comment Response GEN-1, "Comment Included as Part of the Record."

NEIL-4: Please refer to Master Comment Response COST/BEN-1, "Intent of EIS and Process to Determine Federal Interest," and Master Comment Response COST/BEN-2, "Comments Related to the SLWRI Feasibility Report."

NEIL-5: Please refer to Master Comment Response ALTR-1, "Range of Alternatives – General."

NEIL-6: Please refer to Master Comment Response PLAR-1, "Effects to Private Residences and Businesses."

NEIL-7: Please refer to Master Comment Response REC-1, "Effects to Recreation at Shasta Lake."

NEIL-8: Please refer to Master Comment Response RBR-2, "Reduced Public Access around Shasta Lake."

NEIL-9: Please refer to Master Comment Response GEN-5, "Some People Support Dam Raise and Others Oppose Dam Raise."

NEIL-10: Comment noted.

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33.6 Comments from Federal Agencies and Responses

This section contains copies of comment letters from the Federal Government agencies listed in Table 33.6-1. As noted previously, each comment in the comment letters was assigned a number, in sequential order (note that some letters may have more than one comment). The numbers were then combined with an abbreviation for the Federal agency (example: EPA-1).

Responses to the comments follow the comment letters, and are also numbered, corresponding to the numbers assigned in the letters. The letters and associated responses are sorted alphabetically by abbreviation and appear in the section in that order.

Table 33.6-1. Federal Agencies Providing Comments on Draft Environmental Impact Statement

Abbreviation	Agency
EPA	U.S. Environmental Protection Agency, Region IX
USACE	U.S. Army Corps of Engineers
USFS1	U.S. Forest Service
USFS2	U.S. Forest Service
USFWS1	U.S. Department of the Interior, Fish and Wildlife Service, Sacramento Fish and Wildlife Office
USFWS2	U.S. Department of the Interior, Fish and Wildlife Service, Sacramento Fish and Wildlife Office
WAPA	Department of Energy, Western Area Power Administration

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33.6.1 U.S. Environmental Protection Agency, Region IX

EPA

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

SEP 3 0 2013

David Murillo, Regional Director
Bureau of Reclamation, Mid-Pacific Region
2800 Cottage Way, MP-700
Sacramento, CA 95825

Subject: Draft Environmental Impact Statement for Shasta Lake Water Resources Investigation, California (CEQ# 20130196)

Dear Mr. Murillo:

The U.S. Environmental Protection Agency has reviewed the Draft Environmental Impact Statement for the Shasta Lake Water Resources Investigation. Our comments are provided pursuant to the National Environmental Policy Act, Council on Environmental Quality regulations (40 CFR Parts 1500-1508), and our NEPA review authority under Section 309 of the Clean Air Act.

EPA-1 As a crucial storage facility for the Central Valley Project, Shasta Lake is a vital part of California's water supply and economy, and a major influence on the beneficial uses of the Sacramento River. We are aware that Bureau of Reclamation has pursued feasibility studies regarding the enlargement of Shasta dam and reservoir as part of CALFED planning efforts and pursuant to several public laws since 1980. The Draft EIS evaluates five action alternatives that vary in terms of the height of the dam raise and the allocation of the additional water storage among various beneficial uses. We understand that Reclamation plans to identify a preferred alternative in the Final EIS.

EPA-2 Based on our review of the Draft EIS, we have rated all the Action Alternatives and the document as Environmental Concerns – Insufficient Information (EC-2). Please see the enclosed "*Summary of EPA Rating Definitions*". Our detailed comments and recommendations are enclosed. We recommend including aquatic habitat enhancements as elements of each project alternative, rather than as elements of only two alternatives. Augmenting spawning gravel and restoring aquatic habitat may benefit species as a cost-effectively and efficiently as controlling water temperature. We also recommend additional mitigation measures such as construction and operation of more advanced wastewater treatment plants, assistance with remedial efforts at abandoned mines, and watershed protection and enhancement projects that focus on reducing chronic sources of sediment.

EPA-3
EPA-4
EPA-5
EPA-6

EPA-7 EPA appreciates the opportunity to provide input on this project. We are available to discuss all recommendations provided. When the Final EIS is released for public review, please send one hard copy and one CD to the address above (Mail Code: CED-2). If you have any questions, please contact me at 415-972-3521, or contact Stephanie Skophammer, the lead reviewer for this project. Stephanie can be reached at 415-972-3098 or skophammer.stephanie@epa.gov.

Sincerely,

Kathleen Martyn Goforth, Manager
Environmental Review Office
Communities and Ecosystems Division

Enclosures: Summary of EPA Rating Definitions
Detailed Comments

cc: Katrina Chow, Bureau of Reclamation
Rocky Montgomery, U.S. Fish and Wildlife Service
Maria Rea, National Marine Fisheries Service
Patricia Bratcher, California Department of Fish and Wildlife
Philip Woodward, Central Valley Regional Water Quality Control Board
Kathy Mrowka, Central Valley Regional Water Quality Control Board
Michael Nepstad, U.S. Army Corps of Engineers

EPA-2
CONTD

SUMMARY OF EPA RATING DEFINITIONS*

This rating system was developed as a means to summarize the U.S. Environmental Protection Agency's (EPA) level of concern with a proposed action. The ratings are a combination of alphabetical categories for evaluation of the environmental impacts of the proposal and numerical categories for evaluation of the adequacy of the Environmental Impact Statement (EIS).

ENVIRONMENTAL IMPACT OF THE ACTION

"LO" (Lack of Objections)

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

"EC" (Environmental Concerns)

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

"EO" (Environmental Objections)

The EPA review has identified significant environmental impacts that should be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

"EU" (Environmentally Unsatisfactory)

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the Council on Environmental Quality (CEQ).

ADEQUACY OF THE IMPACT STATEMENT

"Category 1" (Adequate)

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

"Category 2" (Insufficient Information)

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analysed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

"Category 3" (Inadequate)

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analysed in the draft EIS, which should be analysed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From EPA Manual 1640, Policy and Procedures for the Review of Federal Actions Impacting the Environment.

U.S. EPA DETAILED COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR SHASTA WATER RESOURCES INVESTIGATION, CALIFORNIA SEPTEMBER 30, 2013

Alternatives

EPA-8 The Bureau of Reclamation evaluates five alternatives for raising Shasta Dam to various heights with the additional storage being allocated for agricultural uses, municipal and industrial uses, anadromous fish uses, or some combination thereof. The purpose and need for the project is to improve operational flexibility of the Delta watershed system by modifying the existing Shasta Dam and Reservoir to meet specified objectives. These dual objectives include, among others, increasing survival of anadromous fish and increasing water supply reliability. A suite of management measures common to all the alternatives includes modifying the temperature control device, reducing demand by allocating funds for water conservation efforts, and enlarging the cold-water pool (p. 2-24).

The Draft EIS states that the primary objectives are given equal priority (p. 2-5). All alternatives provide increased water supply reliability, and this screening criterion removed many alternatives from further consideration (see Scenarios Considered but Dismissed on page 2-99).

EPA-9 We note, however, that only Alternatives CP4 and CP5 include aquatic habitat enhancements, such as augmenting spawning gravel and restoring riparian, floodplain, and side channel habitat - activities that may benefit the listed fish species in the most effective and cost-effective way other than controlling water temperature. It is not clear why these measures were not included in all the alternatives, as they would help to meet the objective of increasing the survival of anadromous fish, independent of dam augmentation.

Recommendation:

EPA-10 Consider including aquatic habitat enhancements for fish, such as those included in Alternatives CP4 and CP5, as part of all the alternatives. In addition to those already included in Alternatives CP4 and CP5, consider incorporating into all of the alternatives other instream aquatic habitat enhancements, such as anchored complex woody debris structures or erosion resistant vegetation near the mouths of the tributaries.

Water Quality

EPA-11 The Draft EIS states that vegetation clearing, relocation of activities, and wave-related shoreline erosion all have the potential to have short-term and long-term sediment impacts. Shoreline processes, including constantly changing reservoir levels that vary month to month and year to year, would provide a constant mechanism by which soil in the new area of inundation could be eroded into the lake, resulting in elevated levels of suspended sediment and turbidity. The quantity of sediment may be on the scale of millions of cubic yards; however, the Draft EIS states that these impacts cannot be quantified because of the size of the lake and the number of variables that influence sediment transport.

EPA-12 The Draft EIS indicates that the direct and indirect impacts to surface water quality, including increased turbidity, could be significant, but would be less than significant after mitigation (p. 7-81). It is not clear how this was determined. The document does not provide sufficient details regarding the mitigation to assess its effectiveness or likelihood of success (p. 7-279).

EPA-13 Hydrologic changes from increased storage and release of water from Shasta Lake have the potential for channel incision and bank erosion below the dam. This is caused by trapping sediment behind the dam and changes in the hydrograph and river stage that effectively lowers the base level of the tributaries. Raising the dam would allow more winter runoff storage which could lower the river stage below the dam during runoff events in the tributaries downstream, causing channel incision, loss of beneficial gravel, and bank erosion.

EPA-13 CONTD: These impacts may affect the beneficial uses assigned to Shasta Lake and downstream in the Sacramento River. These beneficial uses include drinking water supply, freshwater habitat, migration, and spawning. The Draft EIS does not provide specific mitigation measures related to water quality impacts that may occur as a result of the project. The only mitigation proposed is to prepare a Stormwater Pollution Prevention Plan and a remediation plan for historic mine features in the future.

Recommendation:

EPA-14: The Final EIS should provide a reasonable quantitative estimate of the sediment impacts expected from an enlargement of Shasta reservoir and disclose the likely results with regard to beneficial uses in the project area.

EPA-15: The Final EIS should explain how mitigation would lessen the impacts of erosion on water quality in the project area to less than significant. Mitigation actions that should be explored include construction and operation of more advanced wastewater treatment plants, assistance with remedial efforts at abandoned mines, and watershed protection and enhancement projects that focus on reducing chronic sources of sediment.

Endangered and Threatened Species

EPA-16: The US Fish and Wildlife Service, National Marine Fisheries Service, and California Department of Fish and Wildlife, while not cooperating agencies, have been involved for many years and provided comments on feasibility reports and administrative drafts of the EIS. EPA understands that Reclamation intends to initiate consultation under the Endangered Species Act in the future but has not yet done so. On this note, EPA encourages Reclamation to continue to engage with the fish agencies to respond to the dual objectives, employ the best modeling, as well as provide appropriate mitigation for any adverse impacts to species. All of these issues should be addressed in the Final EIS.

EPA-17: SALMOD is the salmon production and mortality model used for the Shasta Enlargement EIS. SALMOD has significant limitations that are described in the appendix to the Draft EIS. For the benefit of the public and decision makers, these limitations should be discussed in more detail in the body of the Final EIS. For example, SALMOD is a comparative model, so any smolt increases should be described in a comparative fashion and the EIS should indicate that these are not firm population increases. SALMOD is not a life cycle model and it does not account for population trends over time nor how those trends may affect annual production.

EPA-18: Additionally the Anadromous Fish Restoration Program has a goal of doubling salmon populations that has also been included in the Water Quality Control Plan as a water quality standard. The Final EIS should describe whether the actions of this project will have a significant impact on achieving this goal.

EPA-19: The Draft EIS indicates that a reduction in the magnitude, duration, or frequency of intermediate to large flows in the Sacramento River would occur as a result of a dam raise and that this is potentially significant (p. 11-269). Capturing more water in wet years would reduce peak flows, which are known to be highly beneficial to fish, as such flows activate floodplains and generally yield good recruitment years for anadromous fish. The reduction in flows in these years and the exposure of fish to more low water years (as some of the water is held in the reservoir and not released downstream) would likely have an adverse effect on juvenile salmonids and other species that rely on floodplain and bypass inundation for foraging. The mitigation proposed is to "develop and implement a mitigation and adaptive management plan to avoid and compensate the impact of altered flow regimes."

EPA-20 Additionally, the anadromous fish benefits, as quantified in the Draft EIS, are minimal (i.e. winter run Chinook salmon Table 11-45 p. 11-285) and many of the impacts to these species are not quantified for clear comparison to the benefits.

Recommendations:

EPA-21 We urge Reclamation to coordinate with USFWS and NMFS on the timing of the Final EIS and the Biological Opinions. The Final EIS should provide an update on the consultation process. We strongly recommend including the Biological Opinion as an appendix.

EPA-22 Continue to consult with USFWS, NMFS, and CDFW to develop appropriate mitigation strategies to minimize the severity of the impacts of reduced peak flows. Mitigation and monitoring measures that would protect sensitive biological resources, including salmon, Shasta snow wreath, bald eagle, and others should be identified in the Final EIS. Flow regimes should be developed that promote natural geomorphic processes necessary to restore riparian and floodplain habitat with the least negative effects.

EPA-23 The limitations of SALMOD should be more clearly stated and potential benefits of the dam enlargement should be accurately acknowledged in the context of all Reasonable and Prudent Measures, Salmon Recovery Program and the Salmon Doubling Goal considered by the fish agencies.

EPA-24 The negative impacts of modifying the hydrology such that there are fewer high flow events should be weighed against the benefits of increasing the cold water pool for anadromous fish and Delta smelt. It is unclear whether the proposed project has a net benefit or adverse impact to threatened and endangered anadromous fish.

EPA-25 The Final EIS should assess the actual impacts to fish, alongside the benefits, to generate a cumulative impact from the negative and positive impacts. For example, the benefits to anadromous fish are limited to a few critical and dry years.

EPA-26 Analysis of impacts should not conclude that, if the impact is greater than a 5% change but is still below the standard, there is no significant impact (e.g. Old Middle River and X2 Delta outflow standard). Scientific research has shown that these physical factors are highly correlated with aquatic life impacts.

National Historic Preservation Act

EPA-27 The Draft EIS states that hundreds of prehistoric resources, ancestral villages, sacred lands, and traditional cultural properties will be inundated or otherwise affected by a raise in Shasta dam and reservoir (p. 14-23). Consultation for tribal cultural resources is required under Section 106 of NHPA. Section 106 of the NHPA requires a federal agency, upon determining that activities under its control could affect historic properties, to consult with the appropriate State Historic Preservation Officer/Tribal Historic Preservation Officer (SHPO/THPO). Section 106 of the NHPA requires that Federal agencies consider the effects of their actions on cultural resources, following regulation in 36 CFR 800.

Recommendation:

The Final EIS should discuss how Reclamation would avoid or minimize adverse effects on the physical integrity, accessibility, or use of cultural resources in the area. The Final EIS should

EPA-27 CONTD discuss how Reclamation plans to fulfill its obligations under NHPA, including any future tribal consultation.

Wetland Impacts and Mitigation

EPA-28 The Draft EIS states that approximately 51 acres of wetlands would occur in the impoundment and relocation areas, but that all information regarding jurisdictional waters is just preliminary (p. 12-65). It is unclear how many acres exist currently and whether any of these acreage values are based on a US Army Corps of Engineers-verified jurisdictional delineation.

EPA-29 The Draft EIS is inconsistent in its discussion of mitigation for wetland impacts. For example, specific Best Management Practices (BMPs) and other measures to reduce temporary construction-related impacts to "less than significant levels," are described, while mitigation for permanent wetland losses is not as clearly addressed (p.12-179). A CWA Section 404 permit may be needed for this project. Unavoidable impacts to wetlands must be fully mitigated pursuant to Section 404 requirements. Note that mitigation should compensate for both permanent losses, and residual temporal losses following application of construction BMPs.

Recommendations:

EPA-30 EPA encourages integration of the NEPA and CWA Section 404 permitting process to reduce overall project review timelines and to provide more thorough analysis of potential aquatic resource impacts through the NEPA process. Although detailed wetland delineations may not be available until later in the CWA Section 404 permitting process, we recommend that the Final

EPA-31 EIS disclose the expected acreage of both permanent (drawdown-related) and temporary (construction-related) wetland losses, as well as the basis for the wetland loss estimates. If estimates are not based on a Corps-verified jurisdictional delineation, the Final EIS should note

EPA-32 that these estimates are preliminary and will be revisited in more detail during the Section 404 permitting phase using standard Corps protocols.

EPA-33 Ecosystem functions provided by the specific wetland areas that could be lost should be discussed, and measures that could mitigate such impacts should be identified. The Final EIS should depict the probable areas of wetland loss on maps.

EPA-34 Delete the section on page 3-47 that describes the MOU for the CALFED process and Section 404 permit decision. Any CWA Section 404 analysis that would occur as part of this project will need a new permit application and would not be tiered from the CALFED 2000 ROD.

Feasibility Reports

EPA-35 The Draft EIS states that Federal and State Feasibility Reports have been developed to provide detailed information on the potential project benefits and costs, the allocation of costs to potential project beneficiaries, and project participants. The identification of final project participants and beneficiaries and potential benefits and costs will influence the selection of the preferred alternative in the Final EIS.

Recommendation:

To ensure full public disclosure to support decision-making, we recommend that the conclusions of the Federal and State Feasibility Reports be summarized in the body of the Final EIS, and the Reports be included as appendices in the Final EIS.

4

Responses to Comments from U.S. Environmental Protection Agency, Region IX

EPA-1: The preferred alternative is identified in the Final EIS.

EPA-2: Thank you for your comments. As a follow-up, Reclamation met with EPA representatives to describe how the impacts/mitigation discussion has been revised in the EIS to address EPA's rating.

EPA-3: The development of action alternatives and the focus and major components of each action alternative are described in the EIS Chapter 2, "Alternatives," Section 2.1, "Alternatives Development Process," and Section 2.3, "Action Alternatives." As described in the Final EIS, the dam raise height and primary focus of each action alternative is as follows:

CP1 – 6.5-foot dam raise, primarily focused on anadromous fish survival and water supply reliability

CP2 – 12.5-foot dam raise, primarily focused on anadromous fish survival and water supply reliability

CP3 – 18.5-foot dam raise, primarily focused on anadromous fish survival and agricultural water supply reliability

CP4 and CP4A – 18.5-foot dam raise, anadromous fish survival focus, while also increasing water supply reliability

CP5 – 18.5-foot dam raise, primarily focused on increased water supply reliability, anadromous fish survival, Shasta Lake area and upper Sacramento River environmental resources, and increased recreation opportunities

Different components/measures were incorporated into each action alternative based on the focus of the action alternative, as a way to make distinctions between costs and benefits. As shown above, CP1, CP2, and CP3 have a joint focus on anadromous fish survival and water supply reliability. Therefore, CP1, CP2, and CP3 primarily include measures that simultaneously address both primary objectives, such as increasing the conservation storage in Shasta Reservoir, and measures that would be required for construction and operations of any Shasta Dam raise, such as modification of hydropower facilities and the temperature control device. In contrast, CP4 and CP4A focus primarily on anadromous fish survival, and CP5 focuses more broadly on both the primary and secondary objectives. Accordingly, based on the focus of these alternatives, augmenting spawning gravel and restoring riparian, floodplain, and side channel habitat in the upper Sacramento River were included only in CP4 and CP5.

Spawning gravel augmentation and riparian, floodplain, and side channel restoration could be added into any of the action alternatives as the comment suggests, however it cannot substitute for additional cold water storage and releases from Shasta Dam, which is a critical limiting

factor for salmonids in the Upper Sacramento River below Shasta Dam. Including gravel augmentation and other downstream habitat improvements in some alternatives and not others was a way to make further distinctions in costs and benefits, based on the focus of each alternative. Reclamation's preferred alternative, CP4A has been developed to incorporate elements from CP2 and CP4 in an attempt to balance benefits and impacts. CP4A does include a commitment to include spawning gravel augmentation in the Final Feasibility Report and Final EIS in the action alternative that is recommended for the Secretary of Interior's consideration for Congressional action.

Preliminary economic evaluations show that CP1 and CP3 are not cost-effective. Adding additional components to these alternatives would not improve the cost-effectiveness of these alternatives. Therefore, adding downstream habitat improvements to CP1, CP2 and CP3 would not make any of these alternatives cost-effective. The benefits used to quantify the cost/benefit ratio did not include the benefits of the downstream habitat improvements for CP4 or CP5, but did include the benefits of the additional cold water releases.

EPA-4: The EIS, Chapter 2, "Alternatives," includes a number of physical features that are incorporated into each action alternative. As part of the project description, Reclamation is committed to addressing impacts to a number of wastewater treatment facilities (e.g., septic tanks/drain fields) by either connecting to existing systems or development of new localized wastewater treatment facilities.

In Chapter 2, Section 2.3.8, "Comprehensive Plan Construction Activities," of the DEIS includes the following language that is specific to this comment:

> *"For relocation of wastewater treatment facilities, new septic systems may be constructed on the property if they meet Shasta County requirements for separating septic systems from the lake. Otherwise, the comprehensive plans include facilities for pressurized sewer collection systems to transport wastewater flows to centralized package wastewater treatment plants.*
>
> *Demolished facilities would not be reused to construct relocated facilities. Demolished and relocated utilities are summarized as part of the detailed description of each action alternative. The approach and methodology for demolition, design, and relocation criteria for each category of utilities are discussed in greater detail in the Engineering Summary Appendix."*

EPA-5: There are two historic mining districts in close proximity to Shasta Lake: one west of Shasta Dam and the other between the McCloud and Squaw arms of Shasta Lake. Reclamation is working closely with the Forest Service, BLM and other landowners to identify opportunities to improve water quality as part of the comprehensive mitigation strategy described in Chapter 2, "Alternatives," of the Final EIS. In Chapter 7, "Water Quality," mitigation measures have been revised and/or enhanced to address the potential impacts of metals from historic mining operations (i.e., Bully Hill mine complex). While specific mitigation actions are still under development, Reclamation is committed to working with responsible and cooperating agencies on this issue should an alternative is authorized by Congress.

EPA-6: An enhanced discussion of environmental commitments and mitigation measures is included in Chapter 2, "Alternatives," Chapter 4, "Geology, Geomorphology, Minerals, and Soils," Chapter 7, "Water Quality," and the Preliminary Environmental Commitments and Mitigation Plan Appendix. Specifically, mitigation measures have been developed by an interagency, interdisciplinary team that focused on watershed protection, ecosystem enhancement and sediment reduction to receiving water bodies (e.g., McCloud River).

EPA-7: Thank you for the contact information. The SLWRI mailing list has been updated.

EPA-8: More information on project purpose and need and objectives can be found in DEIS Chapter 1, "Introduction," Section 1.2, "Purpose and Need/Project Objectives," and Chapter 2, "Alternatives," Section 2.1, "Alternatives Development Process." More information on action alternatives evaluated in the DEIS, including management measures common to all action alternatives, can be found in DEIS Chapter 2, Section 2.3, "Action Alternatives."

Please see Master Comment Response P&N-1, "Purpose and Need and Objectives," and Master Comment Response ALTR-1, "Range of Alternatives – General."

EPA-9: Please see response to comment EPA-3.

EPA-10: A large number of management measures to address increasing anadromous fish survival were prioritized in collaboration with federal and state trustee agencies including USFWS and CDFW (formerly California Department of Fish and Game (CDFG)) during the plan formulation process. Subsequently, Reclamation continued to consult with agencies and stakeholders to determine the feasibility of these measures; ultimately the planning team determined that the gravel augmentation and restoration of riparian, floodplain, and side channel

habitat in the mainstem of the upper Sacramento River were prioritized above other potential measures for increasing anadromous fish survival.

During this process, sites were identified and measures were developed that could be used to augment spawning gravel and to restore riparian, floodplain, and side channel habitat in the mainstem of the upper Sacramento River. These sites and measures were prioritized because they would directly improve habitat in the mainstem Sacramento River, where synergy would exist with improved flow and water temperature conditions provided under SLWRI action alternatives, and also providing the highest value of spawning and rearing habitat for anadromous fish in the mainstem Sacramento River. Several of these sites are near the mouths of tributaries to the upper Sacramento River (e.g., Cottonwood Creek). Reclamation anticipates that elements such as anchored, complex woody debris or other habitat features could be specific components that could be incorporated into site-specific evaluations in the next phase of the SLWRI planning process. While we understand the value of improving downstream habitat beyond mitigation for project effects, the anadromous fish benefits of the SLWRI is focused on habitat improvements that result from raising Shasta Dam.

EPA-11: In addition to the revisions made to Chapter 2, "Alternatives," Chapter 4, "Geology, Geomorphology, Minerals, and Soils," Chapter 7, "Water Quality," of the EIS with respect to impacts and mitigation measures, Attachment 1 to the Geologic Technical Report has been revised to enhance the discussion of shoreline erosion. The DEIS, Impact Geo-5, did provide a quantitative discussion of the impacts of shoreline erosion for two discrete time-steps, 15-years and 60-years. For CP4:

> *For the first 15 years after the dam raise, the average rate of shoreline erosion would increase substantially, from 90 cubic yards per acre per year to about 300 cubic yards per acre per year. For the first time step (i.e., 15 years), the total average annual volume of potential shoreline erosion from CP3 would be about 767,000 cubic yards per year. Within 60 years of the dam raise, the average annual volume is predicted to decrease to 216,000 cubic yards per year.*

In addition to refining the information used for this analysis (e.g., additional field data), Reclamation has identified a number of environmental commitments and mitigation opportunities that would be implemented to reduce impacts to and/or improve water quality in Shasta Lake (and tributary watersheds) and the Upper Sacramento River. The Preliminary Environmental Commitments and Mitigation Plan

Appendix provides additional details on these commitments and opportunities. For example, Mitigation Measure WQ-1, "Develop and Implement a Comprehensive Multi-scale Sediment Reduction and Water Quality Improvement Program Within Watersheds Tributary to the Primary Study," is a multi-faceted mitigation measure that will be implemented to reduce overall sediment load to receiving water bodies, including Shasta Lake and its tributaries using site-specific treatments (road-related sediment) and landscape scale actions (fuel reduction measures).

EPA-12: Chapter 2, "Alternatives," and Chapter 7, "Water Quality," of the EIS have been revised to clarify the distinction between environmental commitments and mitigation. In Chapter 2, "Alternatives," of the EIS, revisions have been made to acknowledge that preparation and implementation of the Stormwater Pollution Prevention Plan (SWPPP) is an environmental commitment made by Reclamation as part of the project description.

The discussion of turbidity impacts within Shasta Lake and the upper Sacramento River has been enhanced in Chapter 7, "Water Quality," of the EIS. Specifically, the affected environment section (supplemented by the Water Quality Technical report and Geology Technical Report – Attachment 1) has been revised to respond to the commenters question on turbidity.

Mitigation Measure WQ-1 has been revised to include a description of mitigation opportunities that was developed by Reclamation with involvement from federal responsible and cooperating agencies. Mitigation opportunities are taken into account in the revised discussion of water quality impacts on beneficial uses in Chapter 7, "Water Quality," of the EIS.

EPA-13: Chapter 4, "Geology, Geomorphology, Minerals and Soils," of the EIS has been revised to clarify potential effects to geomorphology downstream from Shasta Dam. This includes additional discussion related to both potential tributary head cutting and general geomorphic changes to the upper Sacramento River.

Mitigation for potential effects to geomorphology and associated potential effects to water quality, wildlife, and fisheries downstream from Shasta Dam has been further developed for inclusion in the Final EIS.

Chapter 7, "Water Quality," of the EIS has been revised to enhance the discussion related to impacts of sediment (e.g., bedload, suspended sediment, turbidity) on beneficial uses associated with Shasta Lake and the upper Sacramento River.

EPA-14: As described in responses to EPA-12 and EPA-13, Chapter 2, "Alternatives," Chapter 4, "Geology, Geomorphology, Minerals, and Soils," Chapter 7, "Water Quality," and Attachment 1 to the Geologic Technical Report have been revised to enhance the understanding of the relationship between SLWRI-related sediment impacts and beneficial uses. Information from a recent report on the water quality of the upper Sacramento River was incorporated into these chapters. Specifically, this new information clarifies that the sediment is not a key constituent that is having negative affects to municipal and industrial water supplies derived from the upper Sacramento River.

Attachment 1 to the Geologic Technical Report has been revised to include additional field data that was used to better calibrate the shoreline erosion predictions presented in Chapter 4, "Geology, Geomorphology, Minerals, and Soils." Subsequent to developing the DEIS, additional field investigations were conducted to support the shoreline erosion model described in this chapter. In addition, additional GIS analysis was performed to revise and substantiate the estimates of shoreline erosion for each alternative.

EPA-15: The EIS has been revised to clarify the distinction between environmental commitments and mitigation measures. Examples of this are illustrated in Chapter 2, "Alternatives," and include conversion of Mitigation Measure WQ-1 (SWPPP) to an environmental commitment. In Chapter 7, "Water Quality," Mitigation Measure WQ-1 has been replaced with a detailed mitigation framework responsive to impacts relate to several water quality impacts.

Responses to comments EPA-4, EPA-5 and EPA-14 also respond to this comment as they relate to water treatment, abandoned mines and sediment soured reduction.

The EIS also includes the Preliminary Environmental Commitments and Mitigation Plan Appendix that provides a comprehensive summary of these commitments and mitigation measures.

EPA-16: Chapter 1, "Introduction," describes the roles and relationships of cooperating, responsible and trustee agencies. In addition to its roles as a responsible and trustee agency, the USFWS is a cooperating agency for the SLWRI EIS. Chapter 33, "Public Comments and Responses," documents the comments and Reclamation's response to these agencies.

Throughout the plan formulation process and subsequent NEPA process, Reclamation has engaged and with USFWS, NMFS and CDFW to ensure that the EIS satisfies the requirements of these agencies to the extent possible with respect to future consultation and/or permitting efforts that would proceed subsequent to issuing the Final EIS.

Chapter 32, "Final EIS," identifies Reclamation's preferred alternative which would be the basis for preparation of Reclamation's Biological Assessment consistent with ESA requirements.

Please refer to Master Comment Response DSFISH-2, "Fisheries Models and Tools."

EPA-17: Please refer to Master Comment Response DSFISH-1, "SALMOD Model for Sacramento River Chinook Salmon," and Master Comment Response DSFISH-2, "Fisheries Models and Tools."

EPA-18: Please refer to Master Comment Response DSFISH-8, "National Marine Fisheries Service Recovery Plan, Anadromous Fish Restoration Program, Doubling Goals and Biological Opinions."

EPA-19: Impact Geo-9, "Substantial Increase in Channel Erosion and Meander Migration," in Chapter 4 "Geology, Geomorphology, Minerals, and Soils," Section 4.3.3 "Direct and Indirect Effects" describes the characteristics of peak flows, including the duration, magnitude and rate at which flows change downstream from Shasta Dam.

Please refer to Master Comment Response DSFISH-9, "Flow-Related Effects on Fish Species of Concern."

EPA-20: Please refer to Master Comment Response DSFISH-5, "Fish and Wildlife Coordination Act Report."

EPA-21: Please refer to Master Comment Response ESA-1, "Compliance with the Endangered Species Act."

EPA-22: Please refer to Master Comment Response CMS-1, "EIS Mitigation Plan."

EPA-23: The text has been revised in Chapter 11, "Fisheries and Aquatic Ecosystems," Section 11.3.1, "Methods and Assumptions," and Chapter 5, "SALMOD," of the Modeling Appendix.

Please refer to Master Comment Response DSFISH-1, "SALMOD Model for Sacramento River Chinook Salmon," Master Comment Response DSFISH-2, "Fisheries Models and Tools," and Master Comment Response DSFISH-8, "National Marine Fisheries Service Recovery Plan, Anadromous Fish Restoration Program, Doubling Goals and Biological Opinions."

EPA-24: As described in Chapter 6, "Hydrology, Hydraulics, and Water Management," Section 6.3.3, "Direct and Indirect Effects," Impact H&H-1, "Change in Frequency of Flows above 100,000 cfs on the Sacramento River below Bend Bridge," there would be a slight

reduction in the frequency of occurrence of flows greater than 100,000 cfs. This, along with the increased benefits to anadromous fish, as described in Chapter 11, "Fisheries and Aquatic Resources," Section 11.3.3, "Direct and Indirect Effects," indicate a net benefit to federally listed anadromous fish resulting from an increased cold water pool through the implementation of the SLWRI.

EPA-25: Please refer to Master Comment Response DSFISH-5, "Fish and Wildlife Coordination Act Report," and Master Comment Response DSFISH-3, "Fish Habitat Restoration."

EPA-26: Impact indicators for Old and Middle Rivers were not strictly based on a 5 percent change (See EIS Chapter 11, "Fisheries and Aquatic Ecosystems," Section 11.3.1, "Methods and Assumptions"):

> *"For purposes of these analyses, a comparison of reverse flows within Old and Middle rivers under the basis-of-comparison and proposed alternative project operations was prepared for the seasonal period extending from January through June. Per the RPAs in the USFWS 2008 and NMFS 2009 BOs, any reduction in Old and Middle River reverse flows (i.e., flows that are more negative) that result in flows greater than (i.e., flows that are more negative) -5,000 cfs are considered to be a significant impact. Additionally, a 5 percent reduction in Old and Middle River flows making them more negative is also considered a significant impact."*

X2 was based on a change in distance per the standard acceptable movement of X2 in kilometers as established in the USFWS 2008 BO (see Chapter 11, Section 11.3.1, "Methods and Assumptions"):

> *"For purposes of evaluating changes in habitat quantity and quality for estuarine species, a significance criterion of an upstream change in X2 location within 1 kilometer (km) of the basis-of-comparison condition was considered to be less than significant. The criterion was applied to a comparison of hydrologic model results for basis-of-comparison conditions and project alternatives, by month and water year, for the months from February through May and September through November."*

EPA-27: Please refer to Master Comment Response CR-1, "Potential Effects to Cultural Resources."

EPA-28: In the DEIS, Reclamation estimated that there were approximately 51 acres of wetland that would occur in the impoundment

and relocation areas using the USACE approved guidelines for wetland delineation for more than 400 miles of shoreline and over 3,000 acres of potential relocation areas. The EIS has been revised to reflect a substantial reduction in the acres of wetlands and other waters that would be subject to relocation impacts (e.g., roads, bridges, marinas). Under CP4A, there would be a net loss of approximately 29 acres of wetlands and loss of approximately 49 acres of riverine waters by conversion to lacustrine waters. This reduction was based on updated engineering and planning information and redefining relocation areas to avoid wetlands and other sensitive resources (e.g., bald eagle nests and cultural sites). Subsequent to issuance of the EIS, Reclamation will submit a draft wetland delineation report to the USACE with a request for preliminary verification as part of the SLWRI planning process.

EPA-29: As described in response to EPA-12, Reclamation has revised Chapter 2, "Alternatives," to clarify the distinction between environmental commitments (i.e., SWPPP) and mitigation measures. As described in Response to EPA-28, the EIS has been revised to reflect best available information with respect to wetland impacts, both permanent and temporary. Reclamation acknowledges that the USACE has various roles as both a cooperating and responsible agency in the SLWRI planning process and is committed to working with responsible agencies in coordinated fashion to ensure compliance with applicable sections of the Clean Water Act (e.g., 404).

Please refer to Master Comment Response CMS-1, EIS Mitigation Plan."

EPA-30: Pursuant to NEPA, the USACE is a Cooperating Agency for this EIS and the responses to USACE comments on the DEIS are included in Chapter 33, "Public Comments and Responses." Reclamation has coordinated with USACE during development of the EIS. Reclamation has also coordinated with the USACE on CWA Section 404 compliance, including participation in a pre-application meeting with USACE staff in the Sacramento District. If a project is authorized by Congress, Reclamation will develop Section 404 permit applications packages and complete the permitting process.

EPA-31: See response to EPA-28.

EPA-32: The language in the EIS was revised to state that the estimated impacts to wetlands and waters of the United States are preliminary and based on the current footprint of alternatives described in the EIS, Chapter 2, "Alternatives."

EPA-33: Section 12.1, "Affected Environment," was enhanced in Chapter 12, "Botanical Resources and Wetlands," of the Final EIS. The

EIS has been revised to enhance the discussion of impacts and related mitigation measures, including the addition of the Preliminary Environmental Commitments and Mitigation Plan Appendix.

EPA-34: The SLWRI EIS is tiering to the CALFED Final PEIS/R and Programmatic ROD, and is therefore relying on the CWA Section 404 MOU as stated in the MOU as follows:

> *"The record of decision for the CALFED final programmatic EIS/EIR includes a CWA Section 404 memorandum of understanding (MOU) signed by Reclamation, EPA, USACE, and DWR. Under the terms of the MOU, when a project proponent applies for a Section 404 individual permit for CALFED projects, the proponent is not required to reexamine program alternatives already analyzed in the programmatic EIS/EIR. USACE and EPA will focus on project-level alternatives that are consistent with the CALFED programmatic EIS/EIR when they select the least environmentally damaging practicable alternative at the time of a Section 404 permit decision."*

EPA-35: The Final EIS does not include a summary of the Feasibility Report, nor does it summarize the entire Feasibility Report. Also, the Feasibility Report does incorporate by reference the Final EIS.

33.6.2 U.S. Army Corps of Engineers

USACE

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO CA 95814-2922

REPLY TO
ATTENTION OF

September 25, 2013

Regulatory Division SPK-2011-00667

Ms. Michelle Denning
U.S. Bureau of Reclamation
2800 Cottage Way
Sacramento, California 95825-1898

Dear Ms. Denning:

We are responding to your June 25, 2013, request for comments on the Draft Environmental Impact Statement (DEIS) for the Shasta Lake Water Resource Investigation (SLWRI). The Corps has reviewed the DEIS and requests that the following comments and recommendations be incorporated into the document.

USACE-1 The Corps of Engineers' jurisdiction within the study area is under the authority of Section 404 of the Clean Water Act for the discharge of dredged or fill material into waters of the United States. Waters of the United States include, but are not limited to, rivers, perennial or intermittent streams, lakes, ponds, wetlands, vernal pools, marshes, wet meadows, and seeps. Project features that result in the discharge of dredged or fill material into waters of the United States will require Department of the Army authorization prior to starting work.

USACE-2 The stated project purpose in the DEIS is, "to improve operational flexibility of the Delta watershed system through modifying the existing Shasta Dam and Reservoir to meet specified primary and secondary project objectives." However, the operational flexibility appears to be the need and is achieved through the real project purpose of water storage. The project purpose in the DEIS seems to predispose the only way to accomplish this is to raise Shasta Dam. By limiting the project alternatives considered to only the raising of Shasta Dam unnecessarily constrains the range of alternatives that must be considered under the Clean Water Act.

USACE-3 The range of alternatives considered for this project should include alternatives that avoid impacts to wetlands or other waters of the United States. The DEIS alternatives analysis should incorporate the requirements of the 404(b)(1) guidelines in order for the Corps to be able to utilize the analysis for permitting under Section 404 of the CWA.

EPA's 404(b)(1) guidelines (40 CFR 230.10) state that no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impacts to the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences. An alternative is considered practicable if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of the overall project purpose. To comply with these guidelines the Corps can only issue a permit for the least environmentally damaging practicable alternative (LEDPA).

USACE-4 Additionally, in the Section 12.3.5 covering Mitigation Measures, the DEIS states that "when feasible jurisdictional waters of the United States would be avoided." The term "when feasible" as it pertains to avoidance and minimization of impacts to waters of the United States, should be eliminated from the document. The USEPA's 404(b)(1) guidelines and the 1990 MOU between the Corps and USEPA,

USACE-4 CONTD.

require that impacts to waters of the United States must be avoided and minimized to the maximum extent practicable in order to comply with the Clean Water Act.

USACE-5 Based on our review of the DEIS it appears the delineation of waters of the United States that will be affected by the raising of Shasta Dam is only partially complete. As we commented during review of the Administrative Draft of the DEIS the investigations should be completed and provided to the Corps for verification. The DEIS stated the investigations will be completed and included in the FEIS. The delineation of waters of the United States should be completed and included in the DEIS so that the documents can be adequately reviewed by both the agencies and the public as part of the NEPA review process. The delineation should not be provided as new information the FEIS. Without the completed reports included in the DEIS the document's assessment of impacts to waters of the United States as a result of the proposed project are incomplete.

USACE-6 The DEIS identifies that at this time there have been no mitigation measures developed to mitigate for the loss of waters of the United States as a result of this project. The DEIS states that additional discussion of mitigation for the loss of waters of the United States will be included in the FEIS. As we commented in our review of the Administrative DEIS, at a minimum a conceptual mitigation proposal to off-set impacts to waters of the United States should be developed and included in the DEIS. This information should be available for the agencies and public review and comment. Without at least a conceptual plan we are unable to evaluate if mitigation for the loss of waters of the U.S. is even possible or if the mitigation itself may have impacts that should be considered in the DEIS. The mitigation proposal should not be provided as new information in the FEIS.

USACE-7 At this time unless the DEIS is revised to incorporate the above recommendations and changes, it does not appear that the Corps will be able to sign the Record of Decision and adopt the SLWRI FEIS for our permit requirements.

Please refer to identification number SPK-2011-00667 in any correspondence concerning this project. If you have any questions, please contact me at the Redding Regulatory Office, 310 Hemsted Drive, Suite 310, Redding, California 96002, by email at *Matthew.P.Kelley@usace.army.mil*, or telephone at 530-223-9534. For more information regarding our program, please visit our website at *www.spk.usace.army.mil/Missions/Regulatory.aspx*.

Sincerely,

Matthew P. Kelley
Senior Project Manager

cc:

Ms. Katrina Chow, U.S. Bureau of Reclamation, 2800 Cottage Way, Sacramento, California 95825-1898
Mr. Jason Brush, U.S. Environmental Protection Agency, WRT-8, 75 Hawthorne Street, San Francisco, California 94105-3901
Ms. Stephanie Skophammer, U.S. Environmental Protection Agency, WRT-8, 75 Hawthorne Street, San Francisco, California 94105-3901

Responses to Comments from U.S. Army Corps of Engineers

USACE-1: Comment noted.

USACE-2: Please refer to Master Comment Response ALTD-1, "Alternative Development- Water Supply Reliability," Master Comment Response P&N-1, "Purpose and Need and Objectives, and "Master Comment Response ALTR-1, "Range of Alternatives – General."

USACE-3: The CALFED Programmatic ROD for the CALFED Final PEIS/R includes a CWA Section 404 memorandum of understanding (MOU) signed by Reclamation, EPA, USACE, and DWR. Under the

terms of the memorandum of understanding (MOU), when a project proponent applies for a Section 404 individual permit for CALFED projects, the proponent is not required to reexamine program alternatives already analyzed in the programmatic EIS/EIR. USACE and EPA will focus on project-level alternatives that are consistent with the CALFED PEIS/R when they select the least environmentally damaging practicable alternative at the time of a Section 404 permit decision.

As stated in Chapter 26, "Other Required Disclosures," The LEDPA would be determined on the basis of the entire environmental review and identified in the ROD, consistent with Section 404(b)(1) of the Federal Clean Water Act (CWA), which requires that only the Least Environmentally Damaging Practicable Alternative may be approved and implemented by a Federal agency. This EIS provides a substantive portion of the environmental information necessary for USACE to determine the LEDPA consistent with Section 404(b)(1) guidelines."

Please refer to Master Comment Response ALTR-1, "Range of Alternatives – General."

USACE-4: Chapter 12, "Botanical Resources and Wetlands," Section 12.3.5, "Mitigation Measures," Mitigation Measure Bot-4, "Mitigate Loss of Jurisdictional Waters" has been revised.

USACE-5: The Final EIS includes additional information on waters of the United States and estimated impacts to waters of the United States. A draft preliminary wetland delineation report will be submitted consistent with Reclamation's schedule.

Please refer to Master Comment Response NEPA-1, "Sufficiency of EIS."

USACE-6: The Final EIS includes additional information on waters of the United States and estimated impacts to waters of the United States. A draft preliminary wetland delineation report will be submitted consistent with Reclamation's schedule. At the present time in the planning process, Reclamation is not in the position to mitigate for loss of waters to the United States.

Please refer to Master Comment Response NEPA-1, "Sufficiency of EIS."

USACE-7: Comment noted.

33.6.3 U.S. Forest Service

USFS1

From: **Rezeau, Nathan L -FS** <nrezeau@fs.fed.us>
Date: Tue, Aug 13, 2013 at 3:22 PM
Subject: SLWRI Tech Report Question
To: "Chow, Katrina C (KChow@usbr.gov)" <KChow@usbr.gov>, "Paasch, Mary (Mary.M.Paasch@us.mwhglobal.com) (Mary.M.Paasch@us.mwhglobal.com)" <Mary.M.Paasch@us.mwhglobal.com>
Cc: "Beres, Virginia -FS" <vberes@fs.fed.us>

Hi Katrina and Mary,

USFS1-1 I was reading through the SLWRI DEIS and saw reference to the *Recreation and Public Access Technical Report* on page 17-27. I can't find that document anywhere on my DEIS file disc. Can you tell me where that report resides and how I may get a copy of it?

Thanks!

Nathan Rezeau
Deputy District Ranger
Shasta-Trinity National Forest
National Recreation Area Management Unit
Office Phone: (530) 242-5560
Email: nrezeau@fs.fed.us

Response to Comment from U.S. Forest Service

USFS1-1: The referenced technical report was incorrectly titled in the text. The commenter can find the requested information in the Engineering Summary Appendix. The text has been revised in the Final EIS, Chapter 17, "Land Use," Section 17.3.4, "Direct and Indirect Effects."

33.6.4 U.S. Forest Service

 USFS2

Comments to DEIS

Rezeau, Nathan L -FS <nrezeau@fs.fed.us> Mon, Sep 30, 2013 at 4:55 PM
To: "Chow, Katrina C (KChow@usbr.gov)" <KChow@usbr.gov>, "bor-mpr-slwri@usbr.gov" <bor-mpr-slwri@usbr.gov>
Cc: "Beres, Virginia -FS" <vberes@fs.fed.us>, "Hawkins, Robert H -FS" <rhhawkins@fs.fed.us>

Katrina,

Please accept the attached comments on behalf of the Forest Service for the SLWRI Draft EIS.

Thank you for the opportunity to comment and we look forward to participating in the planning process.

Regards,

Nathan Rezeau

Acting District Ranger

Shasta-Trinity National Forest

National Recreation Area Management Unit

Office Phone: (530) 242-5560

Email: nrezeau@fs.fed.us

SLWRI DEIS COMMENT FORM - Forest Service.xlsx
20K

Shasta Lake Water Resources Investigation DEIS Comment Form - Version July 2013								
Reviewer Name:		Virginia Beres	Julie Kierstead Nelson			Cindy Luzietti	Nathan Rezeau
Reviewer Email:		vberes@fs.fed.us	jknelson@fs.fed.us			cluzietti@fs.fed.us	nrezeau@fs.fed.us
Reviewer Agency:		Forest Service	Forest Service			Forest Service	Forest Service
Reviewer Mailing Address:							
Date:		Sept 26, 2013	Sept. 20, 2013			Sept 12, 2013	Sept. 29, 2013
ITEM	REVIEWER	CHAPTER TITLE	CH #	PG #	Line #	TEXT	COMMENT
USFS2-1 1	vberes	Land Use	17	5	6	Lakeview	Lakeview Marina is gone.The entire document should be search for this marina to ensure all references have been removed.
USFS2-2 2	vberes	Land Use	17	5	9	the STNF to decommission Digger Bay and construct a new marina at Turntable	Is this why the "windows" plates show Digger Bay as slated for abandonment? I don't believe Digger Bay is to be abandoned.
USFS2-3 3	vberes	Land Use	17	5	17	USFS operates recreation residential tracts at Salt Creek...	The USGS map may spell Didallas Creek "Didallas" but the recreation tract is spelled "DIDALLIS". Didallas Creek Bridge can remain but a search and replace should be done for the recreation residence tract spelling.
USFS2-4	vberes	Alternatives	2	80		Figure 2-5.	Digger Bay is not slated for abandonment
USFS2-5 5	vberes	Summary	0	108		Table S-3 "Turntable Bay"	Any new development at Turntable Bay might not be called Turntable Bay Marina as an existing business may be relocated there. Also "Developments" should not be capitalized.
USFS2-6 6	vberes	Aesthetics	19	93		Table 19-3 "Turntable Bay Marina"	Any new development at Turntable Bay might not be called Turntable Bay Marina as an existing business may be relocated there. Also "Developments" should not be capitalized.
USFS2-7	vberes	Engineering Appendix Plates		39		Plate 39	Digger Bay Marina is not slated for abandonment
USFS2-8 8	vberes	Engineering Appendix		34	7	Decisions about whether individual affected facilities would be modified or relocated would be addressed in conjunction with USFS, based on overall effects on the features of individual facilities as well as operational needs. Some relocated facilities may be consolidated within other existing facilities, rather than being relocated at a currently undeveloped area. All plans for replacing of facilities would be evaluated and approved by USFS.	Facility consolidation will only be considered after all feasible undeveloped relocation sites have been considered.

USFS2-9	9	vberes	Engineering Appendix		33	14	Where is the large chart that Reclamation, MWH and the FS worked on that showed what recreation facilities are affected and the proposed action for them? The draft document we have doesn't have a title but one of the row headers is titled "Shasta Recreation Facilities – Basis for 18.5 Cost Estimate" and the footer states that it is for discussion purposes only, do not distribute.	Your response (MWH-Buck)to this comment was that the FS had agreed at the technical meetings in June and July 2012 to maintain the current level of detail presented for recreation in the Draft EIS and related appendices. We do not believe this to be in true and in fact requested that this chart be incorporated in the draft EIS i.e. we want this chart in the final EIS.
USFS2-10	10	vberes		18	5		Table 18-1 - Kamloops Camp	This is the only reference to Kamloops Camp in draft (not in the "windows" plates either. This camp, under FS special use permit, is located on FS lands and will be highly impacted by the PA and needs to be addressed as an impacted facility. This was an oversight.
USFS2-11	11	JK Nelson	Botanical Resources & Wetlands/Survey &	12	33	16	Considered Sensitive or Endemic by USFS	Updated Region 5 USFS Sensitive Species list was released in July, and effective Aug. 16, 2013; EIS & Botany Technical Report will need editing to reflect changes to USFS status.
USFS2-12		JK Nelson	Table 12.3 Plant Species of Concern	12	34		Northern clarkia	please add that it is also USFS S
USFS2-13		JK Nelson	Table 12.3 Plant Species of Concern	12	34		Pacific fuzzwort	no longer USFS S
USFS2-14		JK Nelson	Table 12.3 Plant Species of Concern	12	34		English Peak greenbriar	no longer USFS S
USFS2-15		JK Nelson	Table 12.3 Plant Species of Concern	12	34		Erythranthe taylori	add to table--currently being ranked. Known to occur in project area
USFS2-16	16	JK Nelson	Botanical Resources & Wetlands/Survey &	12	76	31	In a subsequent court-mandated settlement agreement (2011)	Settlement agreement was voided; Survey & Manage program has reverted to 2001 ROD standards & guidelines
USFS2-17	17	cluzietti	Land Use	17	2	17	Late Successional Reserve	It is misleading to label as just LSR since the Land Allocation is called "Late-Successional Reserves, Managed Late-Successional Areas, and other Threatened, Endangered, or Sensitive Species" in the Forest Plan, and the areas in the Shasta Unit of the NRA were designated for bald eagles and peregrine falcon, and do not contain habitat for late-successional and old-growth related species2
USFS2-18	18	cluzietti	Land Use	17	2	30	STNF LRMP direction for administratively withdrawn area.....	if you are quoting this from page 4-112 of the LRMP, it applies to all allocations of the Shasta Unit NRA not just Administratively Withdrawn, and does NOT apply to all of the STNF as this sentence says.
USFS2-19		cluzietti	Land Use	17	5	16	operates	change to "manages"
USFS2-20	20	cluzietti	Land Use	17	5	28	There are five claims in the NRA....	There were more than 5 claims that predated the withdrawal when the NRA was created. Are you saying there are 5 claims that are still active? I don't believe that are any claims that are active in the NRA anymore--would you be able to give us the locations of these 5 claims?
USFS2-21		cluzietti	Land Use	17	5	32	36 CFR	This is NOT in 36 CFR, it is in 43 CFR.
USFS2-22		cluzietti	Land Use	17	5	30	operating plans	operating plans are required under the regs for locatable minerals (36CFR228 Subpart A) not leasable
USFS2-23		cluzietti	Land Use	17	8	19	Chappie-Shasta	The BLM manages all of the Chappie-Shasta OHV Area.
USFS2-24	24	cluzietti	Land Use	17	9	5	land ownership adjustments	If you are going to use this goal you need to include the information on page 4-19 of the Forest Plan which speaks to land ownership adjustments in the NRA (the desired future condition is clarified by the Standards and Guidelines) and the resource objectives that land ownership adjustments are supposed to support. "Within and adjacent to the NRA acquire available, undeveloped private lands needed to fulfill the management goals and objectives of the recreation resource program. Acquire those parcels of land that are specifically needed: (a) for public development; (b) to protect major visual resource values; (c) to protect prime wildlife habitat; and (d) to preserve important cultural values and make them available for public enjoyment."
USFS2-25	25	cluzietti	Land Use	17	9	25	Provide special management for late successional reserves.....	Add "Late-Successional Reserves and Threatened, Endangered, and Selected Sensitive Species" at front of sentence as that is the name of the management prescription. You have the management prescription title under all the other land allocations.
USFS2-26	26	cluzietti	Land Use	17	29	26	It should be noted that even where site specific.....	Every project or activity must be consistent with the applicable plan components. Determining consistency and resolving inconsistency is found in 36CFR 219.15.
USFS2-27	27	Nrezeau	Recreation	18	66	8, 18, 19	recreation residence would be affected	A survey for recreation residence structures is recommended, similar to what was done for the Lakehead community, so that impacts to recreation residences can be refined.
USFS2-28	28	Nrezeau	Recreation	18	Tables 18-3 and 18-8		Campgrounds	Mariners Point Campground is not listed in any of the impacts tables. Mariner's Point is a developed campground, unlike the other shoreline campgrounds, that will be impacted by inundation and should be listed as impacted.
USFS2-29	29	Nrezeau	Alternatives, & Engineering Appendix	2 & Eng App.	73	Table 2-10	Lakeshore Drive	Due to significant community interest from private residents and business owners, it is recommended that a proposed/ conceptual plan for the realignment of Lakeshore Drive be included as an Engineering Appendix Plate.
USFS2-30		Nrezeau	Aesthetics and Visual Resources	19	4	20	there are 10 marinas on Shasta Lake	There are 9 not 10 marinas on Shasta Lake. Please correct to 9 marinas.

Response to Comments from U.S. Forest Service

USFS2-1: The text has been revised to not include Lakeview Marina in discussion related to recreation activities and marinas.

USFS2-2: Plate 39, "Recreation Site Status," identifies that the marina at Digger Bay will be abandoned, and the site will be used as a public boat ramp under all action alternatives.

USFS2-3: Text in EIS Chapter 17, "Land Use," has been updated to have the proper spelling of Didallis recreation tract.

USFS2-4: Figure 2-5, "Recreation Study Windows," will be updated to not indicate that Digger Bay Marina is to be abandoned. The Engineering Summary Appendix Plate 39, "Recreation Study Windows," will be updated to include the same information.

USFS2-5: Text has been revised to not reference Turntable Bay Marina, because any new development may not be called that; instead, it is identified as the Turntable Bay area.

USFS2-6: Text has been revised to not reference Turntable Bay Marina, because any new development may not be called that; instead, it is identified as the Turntable Bay area.

USFS2-7: Plate 39, "Recreation Site Status," identifies that the marina at Digger Bay will be abandoned, and the site will be used as a public boat ramp under all action alternatives.

USFS2-8: The Engineering Summary Appendix Chapter 4, "Design Considerations for Reservoir Area Infrastructure Modifications and/or Relocations," has been clarified to state that the preference is to relocate recreation facilities in the immediate vicinity.

USFS2-9: The requested table describing preliminary proposed relocations and modifications was added to the EIS Engineering Summary Appendix, Chapter 4, "Design Considerations for Reservoir Area Infrastructure Modifications and/or Relocations."

USFS2-10: Possible Impacts to Kamloops Camp are included in the DEIS Chapter 18, "Recreation and Public Access," in Tables 18-4, 18-6, and 18-8, "Effects of CP1-3 (respectively) on Developed Recreation facilities at Shasta Lake."

USFS2-11: The plant lists in both the Botanical Resources and Wetlands Technical Report and the EIS were revised to reflect the changes to the Region 5 USFS Sensitive Species list as of April 2014.

USFS2-12: This was revised in Table 12.3 in Chapter 12, "Botanical Resources and Wetlands" of the EIS.

USFS2-13: This was revised in Table 12.3 in Chapter 12, "Botanical Resources and Wetlands" of the EIS.

USFS2-14: This was revised in Table 12.3 in Chapter 12, "Botanical Resources and Wetlands" of the EIS.

USFS2-15: This was revised in Table 12.3 in Chapter 12, "Botanical Resources and Wetlands" of the EIS.

USFS2-16: This was revised in Table 12.3 in Chapter 12, "Botanical Resources and Wetlands" of the EIS.

USFS2-17: Comment noted. The land use allocation was relabeled throughout the Final EIS as "Late-Successional Reserves, Managed Late-Successional Areas, and other Threatened, Endangered, or Sensitive Species."

USFS2-18: Comment noted. The requested changes were made to Chapter 17, "Land Use and Planning," Section 17.1.1, "Land Use," in the Final EIS concerning the application of STNF direction.

USFS2-19: Comment noted. The requested changes were made in the Final EIS and can be found in Chapter 17, "Land Use and Planning," Section 17.1.1, "Land Use."

USFS2-20: Comment noted. According to page II-12 of the NRA Guide (STNF 1996) there are seven claims in the NRA that predate the withdrawal and remain open to mineral leasing. Chapter 17, "Land Use and Planning," will be updated in the Final EIS to reflect current information.

USFS2-21: Comment noted. The correct reference (43 CFR) was used in the Final EIS and can be found in Chapter 17, "Land Use and Planning," Section 17.1.1, "Land Use."

USFS2-22: Comment noted. Text was altered in Chapter 17, "Land Use and Planning," Section 17.1.1, "Land Use," of the Final EIS to reflect that operating plans are not required for leasable minerals.

USFS2-23: Comment noted. Text was included in Chapter 17, "Land Use and Planning," Section 17.1.1, "Land Use," of the Final EIS to indicate that BLM manages the Chappie-Shasta OHV Area.

USFS2-24: Comment noted. The requested changes were made to Chapter 17, "Land Use and Planning," Section 17.1.1, "Land Use," in the Final EIS concerning the addition of text regarding land ownership adjustments in the NRA and resource objectives that land ownership adjustments are supposed to support.

USFS2-25: Comment noted. The requested changes were made to Chapter 17, "Land Use and Planning," Section 17.1.1, "Land Use," in the Final EIS.

USFS2-26: Comment noted. The EIS, Chapter 17, “Land Use and Planning,” has been revised accordingly.

USFS2-27: Please refer to Master Comment Response FSCABINS-9, “Structure Surveys for USFS Cabins.”

USFS2-28: The EIS Chapter 18, "Recreation," has been clarified to include the proposed modifications to Mariners Point Campground.

USFS2-29: The proposed alignment of Lakeshore drive has been included in the EIS Engineering Summary Appendix, Chapter 4, “Design Considerations for Reservoir Area Infrastructure Modifications and/or Relocations.”

USFS2-30: Text in EIS Chapter 19, “Aesthetics and Visual Resources,” has been corrected to state that there are currently nine marinas on Shasta Lake.

33.6.5 U.S. Department of the Interior, Fish and Wildlife Service, Sacramento Fish and Wildlife Office

USFWS1

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825-1846

BUREAU OF RECLAMATION
OFFICIAL FILE COPY
RECEIVED
SEP 20 2013

100 ✓ K Dunca
-20Sep13 SEP 19 2013
to: K Cha

In Reply Refer To
08ESMF00-2013-CPA-0021

Memorandum

To: Regional Director, U.S. Bureau of Reclamation, Mid-Pacific Regional Office, Sacramento, California

From: Field Supervisor, Sacramento Fish and Wildlife Office, Sacramento, California

Subject: Shasta Lake Water Resources Investigation, Comments on the Draft Environmental Impact Statement

USFWS1-1 This memorandum transmits the U.S. Fish and Wildlife Service's (Service) general comments on the 2013 Draft Environmental Impact Statement (Draft EIS) for the Shasta Lake Water Resources Investigation Project (Project). The Service received the document for review from the U.S. Bureau of Reclamation (Reclamation) on July 1, 2013. The Service limited its review to selected chapters of the Draft EIS, and did not review the Appendices or Attachments.

The majority of the Service's comments have been previously provided to Reclamation during review of the Administrative Draft Environmental Impact Statement (see Service letters of November 14, 2008, March 22, 2011, and March 7, 2013), the Administrative Draft and Draft Feasibility Reports (see Service letters of November 14, 2008 and February 7, 2013), and the Service Planning Aid Memorandum (September 11, 2008).

General Comments

USFWS1-2 **Purpose and Need for Action**
Reclamation should include a Shasta Lake Water Reliability Investigation (SLWRI) alternative that increases water supply reliability and anadromous fish survival without enlarging Shasta Dam. Since Reclamation has stated in the Draft EIS that the purpose and need for the proposed action is to "improve operational flexibility of the Delta watershed system," then an alternative that would accomplish this without enlarging Shasta Dam should be included (Service draft Fish and Wildlife Coordination Act Report [CAR] for the SLWRI, 2008).

SCANNED

Classification	ENV-6.00
Project	214
Control No.	13042598
Folder I.D.	1261130
Date Input & Initials	9-20-13 RM

Use of SALMOD Model

USFWS1-3 Reclamation has used SALMOD to compare the effects of the different alternatives on the different runs of salmon found in the upper Sacramento River downstream of Keswick Dam. SALMOD is a model based on past conditions, assumptions, and limited variables that is used to make hypothetical comparisons between alternatives, including a baseline "No-Action." The SALMOD model has significant limitations for making these kinds of comparisons. SALMOD is not a life-cycle model, it does not account for population trends over time and how those trends may affect annual production. It does not account for habitat conditions downstream of the Red Bluff Pumping Plant (RBPP), including the Sacramento-San Joaquin Delta and ocean. SALMOD uses CalSim II modeling which is based on monthly averages. This temporal scale is coarse and may compound the uncertainties in SALMOD.

USFWS1-4 *"Because no true calibration has been completed for this SALMOD model application, note that simulated outmigration numbers and their attributes are best used not as absolute values, but rather as relative values* (Prager and Mohr 1999). *Even if the model were fully calibrated, measurements for outmigrating salmon are imprecise and subject to poorly understood biases. Further, because this is not a full life cycle model, including complex estuarine and ocean dynamics, nothing is known about what happens to salmon successfully migrating downstream from the RBDD (RBPP), where other density-dependent phenomena may constrain the populations."* (**Interpreting Model Results**, 5-55, Modeling Appendix; Draft EIS, Reclamation 2013).

USFWS1-5 Based on the description of the appropriate use and interpretation of SALMOD results (Chapter 11, page 49) the results of the model appear to be used in a manner not supported by the model. For example, in the Executive Summary, on page ES-26, Table S-2, under **Benefits Related to Project Objectives**, Production Increase numbers are given as, "Average annual increase in juvenile Chinook salmon surviving to migrate downstream from Red Bluff Pumping Plant. Numbers derived from SALMOD." This use of implied specific increases of salmon from the project is not an appropriate use of the SALMOD results. The projections of salmon production increases presented in this table imply population increases that would result from implementation of the project alternative. These numbers are also included in the described benefits of each alternative in Chapter 2. This could easily be misinterpreted by someone who does not fully understand the limitations of the model.

USFWS1-6

USFWS1-7

USFWS1-8 The Service and the California Department of Fish and Wildlife (CDFW) have expressed repeated concerns regarding Reclamation's use of SALMOD in the Service's Planning Aid Memorandum (September 11, 2008), draft CAR for the SLWRI (June 2008), and comments on the draft Feasibility Report for the SLWRI (February 2013); and the CDFW letter of February 3, 2006.

Benefits to Anadromous Fish

USFWS1-9 The Service believes Reclamation is overestimating the potential benefits of the enlargement of Shasta Dam to anadromous fish. As reported in the draft CAR for the SLWRI, only 9-15 percent of the 82 water years modeled appear to show any substantial benefit to salmon. These benefits are limited to alternative CP4 and primarily to winter- and spring-run Chinook salmon. The remaining water years show no substantial benefit and in some water year types a decrease in fish numbers (Table 1). The remaining alternatives (CP1, CP2, CP3, and CP5) show fewer benefits to anadromous fish.

Table 1. Average Percent Increase of Production and Number of Potential Returning Female Spawners, all Runs Combined

Action Alternative	Average Increased Production[1]	Percent of Average Production[2]	Potential Increased Number of Returning Females[3]
CP1	61,300	0.288	153 - 307
CP2	379,200	1.78	948 - 1,896
CP3	207,400	0.975	519 - 1,037
CP4	812,600	3.82	2,032 - 4,063
CP5	377,800	1.78	945 - 1,889

[1] Average increased production according to Reclamation as derived from SALMOD for Action Alternatives (Reclamation 2013)
[2] Average estimated production from 2002 through 2011 of 21,271,465 Chinook salmon fry (B. Poytress, USFWS, *pers. com.* 2013)
[3] Estimated return of 0.5 to 1.0 percent for all runs combined (B. Poytress, USFWS, *pers. com.* 2013)

USFWS1-10 The primary benefit that Reclamation describes as being derived from the dam enlargement for anadromous fish is a larger cold-water pool that would allow Reclamation to better maintain required water temperatures between Keswick Dam and the RBPP. The Service recognizes the importance of water temperature for salmon survival, particularly for the winter- and spring-runs, but there are other factors, such as access to important rearing habitat for juvenile salmon (including floodplains, bypasses, and non-natal tributaries), restoration of downstream fish habitats (including restoration of spawning habitats, shaded riverine aquatic cover and large woody debris), the screening of intakes to eliminate fish entrainment, and flow management that would reduce redd dewatering, that would likely have more substantial effects on the long-term survivability of all anadromous fish in the Sacramento River beyond water temperature (Service draft CAR for the SLWRI, 2008).

USFWS1-11

USFWS1-12 Reclamation has included riparian/fish habitat restoration in the Draft EIS for both CP4 and CP5. However, the six proposed restoration projects remain conceptual only, and Reclamation has only committed to implementing one restoration project, the remaining five are tentative actions.

Reduced Inundation and High Water Periods

USFWS1-13 Access to, and time spent in, high quality rearing habitat for juvenile fish has been shown to be very important in salmonid survivability. The water management that would go along with the

USFWS1-14 enlargement of Shasta Dam would decrease the inundation flows that provide juvenile salmon access to the floodplains, nonnatal streams and tributaries, and bypasses that provide important

USFWS1-14 CONTD
salmonid rearing habitat. The Service does not see where Reclamation has accounted for these impacts in its analysis of effects to anadromous fish. The reduced high water flows would also

USFWS1-15
affect other fish species that benefit from the inundated floodplains and bypasses such as the Sacramento splittail and delta and longfin smelt.

USFWS1-16
The changes in water management operations as a result of enlarging Shasta Dam would reduce the frequency, duration and magnitude of intermediate to large flows downstream from Shasta Dam during winter and spring in some water years, especially wet and above-normal years.

USFWS1-17
These reduced flows would also adversely affect the diversity of riparian forest along the Sacramento River and the recruitment of cottonwood and willow stands. The long-term reduction of cottonwood and willow recruitment would likely have an adverse effect on the populations of a number of neotropical migratory song birds such as the yellow warbler (a species of concern), least Bell's vireo (federally-listed as threatened), and western yellow-billed cuckoo (a candidate species for federal listing).

Spawning Gravel Augmentation

USFWS1-18
Reclamation proposes that part of the ecosystem enhancement for CP4 and CP5 include 10 years of spawning gravel augmentation within the upper Sacramento River. The locations for these gravel augmentations would be determined later.

USFWS1-19
The 10 year duration of spawning gravel augmentation is too short. The reason that it is necessary to augment spawning gravel in the upper Sacramento River is that Shasta Dam has stopped the natural spawning gravel recruitment process. Without the ongoing injections of spawning gravels, salmon spawning sites would diminish over time because of the effects of the dam. As long as Shasta Dam remains in place, blocking the natural recruitment processes, there will be a need for spawning gravel augmentation.

USFWS1-20
The augmentation of spawning gravel in the upper Sacramento River is an ongoing action being undertaken by a number of programs including Reclamation in compliance with the Central Valley Project Improvement Act (CVPIA).

USFWS1-21
Although the opportunities and benefits derived from additional spawning gravel augmentation on the upper Sacramento River are limited, the Service believes that any action that modifies Shasta Dam should also include a spawning gravel augmentation program that augments spawning gravels downstream of Keswick Dam in perpetuity.

USFWS1-22
Reclamation should also include an endowment designed to fund spawning gravel augmentation for the life of Shasta Dam for all the alternatives.

Modified Flow Management

USFWS1-23
No amount of enhancements to the river habitat aimed at increasing anadromous fish survival will be of any real benefit unless river flow levels are managed in a way that provides sufficient flow when needed for anadromous fish survival.

USFWS1-24
Augmenting spawning gravel and then reducing river flow and causing redds to become dewatered is counterproductive and contrary to the stated intent of the Project.

USFWS1-25
The Service recommends that all action alternatives include operational management criteria that will allow for sufficient flows to substantially reduce the instances of redd dewatering and allow juvenile salmonid access to nonnatal tributaries in the upper Sacramento River.

Increased Reverse Flows in the Delta

USFWS1-26 The Draft EIS indicates that reverse flows will increase in Old and Middle Rivers in the Sacramento-San Joaquin Delta (Delta) as a result of the Project. According to the Draft EIS, the increase of reverse flows would likely have an adverse effect on the Delta smelt (*Hypomesus transpacificus*) and other fish species in the Delta, including an increase in entrainment or salvage at the CVPIA and State Water Project facilities. Reclamation does not sufficiently address these effects in the Draft EIS.

USFWS1-27 Analysis of the proposed project's effects on federally-listed species will be completed with the Service and the National Oceanographic and Atmospheric Administration's National Marine Fisheries Service under section 7 of the Endangered Species Act, as amended (16 U.S.C. §1531 *et seq.*) once a preferred alternative is selected.

Any questions or comments regarding these comments should be directed to Mark Littlefield Chief, Watershed Planning Branch, at (916) 414-6520 or Rocky Montgomery, Senior Fish and Wildlife Biologist at (916) 414-6600.

cc:
Patricia Bratcher, California Department of Fish and Wildlife, Redding, CA
Katrina Chow, Bureau of Reclamation, Sacramento

References

Draft Environmental Impact Statement for Shasta Lake Water Resources Investigation, U. S. Bureau of Reclamation, Mid-Pacific Region, June 2013.

Pers. com.:

Bill Poytress, Program Manager SRFM, U.S. Fish and Wildlife Service, Red Bluff Fish and Wildlife Office.

Responses to Comments from U.S. Department of the Interior, Fish and Wildlife Service, Sacramento Fish and Wildlife Office

USFWS1-1: The commenter referenced comments previously submitted by USFWS on Administrative Draft versions of the SLWRI DEIS. At this time we are responding to questions submitted specifically for the public DEIS. Many modifications to the SLWRI have been made pursuant to previous reviews of the various documents related to the project formulation process and Reclamation is not required as part of the NEPA process to review all previous comments on project related documents.

USFWS1-2: Please refer to Master Comment Response ALTD-2, "Alternative Development – Anadromous Fish Survival," and Master Comment Response P&N-1, "Purpose and Need and Objectives."

USFWS1-3: Please refer to Master Comment Response GEN-1, "Comment Included as Part of the Record."

USFWS1-4: Please refer to Master Comment Response DSFISH-1, "SALMOD Model for Sacramento River Chinook Salmon," and Master Comment Response DSFISH-2, "Other Fisheries Models and Tools."

USFWS1-5: Reclamation disagrees with this comment, and feels that SALMOD has been appropriately used for the purposes of this project, and that the results have been used in a manner supported by SALMOD.

Please refer to Master Comment Response DSFISH-1, "SALMOD Model for Sacramento River Chinook Salmon."

USFWS1-6: In Chapter 11, "Fisheries and Aquatic Ecosystems," Section 11.3.1, "Methods and Assumptions," SALMOD inputs are described which show that that the same number of spawners is used every year, showing that SALMOD is not a lifecycle model. As described in the DEIS, SALMOD is used to identify the differences among the No-Action Alternative, Existing Conditions and the action alternatives, not to determine a population estimate. By using the same starting number of spawners each year, the fish are exposed to the same conditions under each alternative, and as such, we are able to identify what alternative would provide the best conditions for survival for each run. Averaging the survival over the 82 year simulation period, whether combining or separating by water-year type allows us to show the overall benefits to each run of Chinook salmon of the SLWRI without implying a population estimate.

USFWS1-7: DEIS Chapter 11, "Fisheries and Aquatic Ecosystems," Section 11.3.1, "Methods and Assumptions," and Chapter 5, "SALMOD," of the Modeling Appendix describe the limitations of SALMOD. Based on comments received, clarifications of the limitations were added to both chapters.

USFWS1-8: The commenter referenced comments previously submitted by USFWS and CDFW on Administrative Draft versions of the SLWRI DEIS, Draft Feasibility Report, and through the production of USFWS and CDFW reports. At this time we are responding to questions submitted specifically for the public DEIS. Many modifications to the SLWRI have been made pursuant to previous reviews of the various documents related to the project formulation process and Reclamation is not required as part of the NEPA process to review all previous comments on project related documents.

USFWS1-9: To respond to this comment, a follow-up conversation with Bill Poytress (USFWS) occurred. The estimates of 0.5 to 1.0 percent for

all runs combined was found to be incorrect and cannot be used to estimate the number of returning females as calculated by the USFWS in this comment. The estimate of 0.5 to 1.0 is the return rate of fall-run Chinook salmon to Coleman Hatchery. Winter-run Chinook salmon have a lower return rate to the Sacramento River. According to CDFW and DWR biologists, there is no correlation between the juvenile to adult return rate for spring-run Chinook salmon, and there is no estimated juvenile to adult return rate for late fall-run Chinook salmon. Therefore, these values presented in the table are considered invalid. However, had the return rates been correct, the returning females would have been as high as over 31,500.

Additionally, the project is primarily intended to improve Chinook salmon survival in critical and dry years, particularly in a drought condition, when they are likely to be most at risk of significant population declines or even extinction. While overall benefits to production when all water year types are combined are insignificant, benefits in dry and critical years are significant. With the added risks of climate change, the benefit of an increased source of cold water adds to the reliability of suitable habitat available for Chinook salmon and other listed fish in the Sacramento River. It is expected that CP4 would have the greatest benefits to Chinook salmon, including both winter-run and spring-run, as it has the greatest focus on a cold water pool for a reliable cool water release to fish during the critical water years. Adding to that, the habitat restoration components provides an additional amount of available habitat necessary to improve conditions that can help increase the number of Chinook salmon and other listed fish in the Sacramento River. By combining all water year types in the calculations made by the USFWS, it mutes the actual benefits of the SLWRI.

USFWS1-10: Please refer to Master Comment Response GEN-1, "Comment Included as Part of the Record."

USFWS1-11: Please refer to Master Comment Response DSFISH-5, "Fish and Wildlife Coordination Act Report."

USFWS1-12: Major components of SLWRI action alternatives are described in EIS Chapter 2, "Alternatives," Section 2.3, "Action Alternatives." As described in the EIS, under CP4 and CP5, riparian, floodplain, and side channel habitat restoration would occur at one or more of six potential locations along the upper Sacramento River. Potential restoration activities at each site are described in Chapter 2, Section 2.3, "Action Alternatives," and related construction activities are summarized in Chapter 2, Section 2.3.8, "Comprehensive Plan Construction Activities." Construction activities for each of the six potential restoration sites are described in more detail in the EIS Engineering Summary Appendix, Chapter 4, "Design Consideration for

Reservoir Area Infrastructure Modifications and/or Relocations," Section "Ecosystem Restoration." For each of the six potential sites the DEIS Engineering Appendix presents the following information:

- Description of site location and potential restoration/enhancement activities
- Maps delineating areas for potential enhancements
- General description of construction activities (e.g., earth moving activities, site access, channel dimensions)
- Estimated construction quantities, including length of modified channel, acreages for vegetation removal and planting, and volumes of excavation and gravel placement

Ground-proofing was performed for each site to confirm site access and feasibility of implementing proposed restoration activities and at each potential site. Additionally, the HEC-RAS hydraulic modelling was used to estimate river stages at different Sacramento River flow rates for the sites to verify hydraulic connectivity. As described above, designs for riparian, floodplain, and side channel habitat restoration at each of the six potential sites were developed to a feasibility level, and this information was included in the Engineering Appendix and summarized in DEIS Chapter 2, "Alternatives."

USFWS1-13: Please refer to Master Comment Response DSFISH-9, "Flow-Related Effects on Fish Species of Concern."

USFWS1-14: As described in Impact Aqua-15 and Impact Aqua-16 in Chapter 11 "Fisheries and Aquatic Ecosystems,", Section 11.33.3 "Direct and Indirect Effects, " the DEIS acknowledges the potential adverse effects of altered flow regimes on the frequency of inundation events that provide juvenile salmonids access to floodplains and other high-quality rearing habitats. Changes in river flow for each alternative, relative to the basis-of-comparison, were used to reflect and evaluate potential impacts to juvenile salmonid rearing habitat that could result from altered flow regimes. For purposes of evaluating the potential effects of changes in Sacramento River flows on fish habitat, and considering the accuracy and inherent noise within the hydrologic model, it was assumed that changes in the average monthly flows less than 5 percent (plus or minus) relative to the basis-of-comparison would not be expected to result in a significant (i.e., detectable) effect on habitat quality or availability. Text was added to the Chapter 11 "Fisheries and Aquatic Ecosystems," Section 11.3.2 "Methods and Assumptions" to clarify the methods.

Please refer to Master Comment Response DSFISH-9, "Flow-Related Effects on Fish Species of Concern."

USFWS1-15: In Chapter 11, "Fisheries and Aquatic Ecosystems," the DEIS acknowledges the potential adverse effects of altered flow regimes on fisheries resources and habitats within the project footprint, including potential impacts to Sacramento splittail, delta smelt, and longfin smelt. Altered flow regimes have the potential to affect these species by affecting quality and access to floodplain and other high-quality spawning and rearing habitats, altering water temperature regimes, increasing entrainment and salvage at Delta export facilities, and increasing the likelihood of reverse flows in the Delta. Effects analyses for these species and these factors are provided in Section 11.3, "Environmental Consequences and Mitigation Measures," of the DEIS. In most instances, potential impacts were found to be less than significant. For those analyses where potential impacts were found to be potentially significant, mitigation in most instances was not proposed because operations will be guided by RPMs or RPAs established by NMFS and USFWS BOs to reduce any impacts to listed fish species, and will thus benefit non-listed fishes as well. In the upper Sacramento River and associated tributaries, altered flow regimes have the potential to significantly impact splittail spawning and rearing habitat; these impacts would be mitigated through implementation of Mitigation Measure BOT-7 and Mitigation Measure Aqua-15.

USFWS1-16: Impact Geo-9: Substantial Increase in Channel Erosion and Meander Migration in Chapter 4, "Geology, Geomorphology, Minerals, and Soils," Section 4.3.3, "Direct and Indirect Effects," describes the characteristics of peak flows, including the duration, magnitude and rate at which flows change downstream from Shasta Dam.

Please refer to Master Comment Response DSFISH-9, "Flow-Related Effects on Fish Species of Concern."

USFWS1-17: Impact Wild-17, "Impacts on Riparian-Associated Special-Status Wildlife Resulting from Modifications to the Existing Flow Regime in the Primary Study" in Chapter 13, "Wildlife Resources," Section 13.3.3, "Direct and Indirect Effects," describes potential impacts of flow modifications on riparian associated special-status wildlife. This impact is considered potentially significant.

USFWS1-18: Please refer to Master Comment Response GEN-1, "Comment Included as Part of the Record."

USFWS1-19: Please refer to Master Comment Response DSFISH-3, "Fish Habitat Restoration."

USFWS1-20: Please refer to Master Comment Response DSFISH-3, "Fish Habitat Restoration."

USFWS1-21: Please refer to Master Comment Response DSFISH-3, "Fish Habitat Restoration."

USFWS1-22: Please refer to Master Comment Response DSFISH-3, "Fish Habitat Restoration."

USFWS1-23: Please refer to Master Comment Response DSFISH-4, "Maintaining Sacramento River Flows to Meet Fish Needs and Regulatory Requirements."

USFWS1-24: Please refer to Master Comment Response Master Comment Response DSFISH-3, "Fish Habitat Restoration and DSFISH-4, "Maintaining Sacramento River Flows to Meet Fish Needs and Regulatory Requirements."

USFWS1-25: Please refer to Master Comment Response DSFISH-4, "Maintaining Sacramento River Flows to Meet Fish Needs and Regulatory Requirements."

USFWS1-26: Based on the flows identified between January and June, flows rarely become more negative than -5,000. Only in July of critical water years is there any potentially significant change from No-Action or Existing Conditions. This is not enough to be considered a potentially significant impact, particularly to delta smelt, nor was it identified as a significant impact in the DEIS. Chapter 11, "Fisheries and Aquatic Ecosystems," Section 11.3.3, "Direct and Indirect Effects," describes the impacts to Delta fish resulting from changes to Old and Middle river flows and identifies the level of impact under each alternative as less than significant.

Please refer to Master Comment Response ESA-1, "Compliance with the Endangered Species Act."

USFWS1-27: Please refer to Master Comment Response ESA-1, "Compliance with the Endangered Species Act."

33.6.6 U.S. Department of the Interior, Fish and Wildlife Service, Sacramento Fish and Wildlife Office

USFWS2

USFWS2-1 On Mon, Jul 1, 2013 at 11:34 AM, Rocky Montgomery <rocky_montgomery@fws.gov> wrote:

> Hi Katrina,
>
> Can I get a copy of the doc on a disk?
>
> Thanks,

Rocky Montgomery
Senior Biologist, Watershed Planning
Sacramento Fish and Wildlife Office
2800 Cottage Way, Rm. W-2605
Sacramento, CA 95825

Responses to Comment from U.S. Department of the Interior, Fish and Wildlife Service, Sacramento Fish and Wildlife Office

USFWS2-1: A hard copy of the DEIS was sent to Mr. Rocky Montgomery on June 26, 2013, and a DVD of the DEIS was included.

33.6.7 Department of Energy, Western Area Power Administration

WAPA

Department of Energy
Western Area Power Administration
Sierra Nevada Region
114 Parkshore Drive
Folsom, California 95630-4710

SEP 27 2013

Ms. Katrina Chow
Project Manager
Planning Division
Bureau of Reclamation
2800 Cottage Way
Sacramento, CA 95258

Dear Ms. Chow:

Western Area Power Administration (Western) appreciates the opportunity to review Reclamation's draft environmental impact statement for the proposed Shasta Lake Water Resources Investigation and is transmitting the following comments.

WAPA-1 In general, at this point in the study process, Western believes that there are too many uncertainties in a number of other ongoing parallel, but inter-related regulatory processes to be able to provide as definitive comments as we'd like on the anticipated outcomes of each alternative future scenario identified in this study. Specifically, the economic and financial feasibility (especially from a cost allocation and repayment ability on the part of the reimbursable project beneficiaries) is going to be especially important in determining the ultimate feasibility of the project.

WAPA-2 Western believes that reduced project accomplishments and increased costs associated with additional regulatory and environmental oversight, resulting in reduced project water accomplishments, have significantly eroded the historic margin between the cost of service and market prices for the Federal hydropower product.

WAPA-3 A recent Department of Interior Inspector General's audit (Report No.WR-EV-BOR-0003-2012 released March 2013) indicated that the irrigation function for the Central Valley Project is currently not on track to fully recover its share of the allocated capital investment costs by the year 2030. The Inspector General found that, if Reclamation was unable to undertake the necessary corrective actions to the rates in a timely manner, the "increases to water contractors ..... could create the potential for rates to exceed irrigation contractors' ability to pay and shift the repayment requirement to power users." If not corrected, and assuming current trends, the projected shortfall could range from a low of $330 million to a high of $390 million. Should this situation be allowed to occur, the overall economic and financial viability of the base Central Valley Project, notwithstanding any new project addition, could be significantly impacted more adversely than what is being assumed in this study.

WAPA-4 The California State Water Resources Control Board (SWRCB) is actively considering new water flow standards in the Sacramento and San Joaquin River systems which when applied to this effort, could also impact not only the timing and reliability, but also the anticipated water and hydropower accomplishments of any proposed dam modification. A final decision in this process will undoubtedly impact the project's water and hydropower accomplishments. Depending on what flow standard is ultimately adopted by the SWRCB, it may be possible that some of the underlying assumptions used to generate the water and hydropower outputs for this study may need to be revisited and/or revised.

WAPA-5 Additionally, Reclamation is currently in the process of reallocating the costs of the "Base" Central Valley Project facilities. The outcome of this effort could potentially affect not only the costs assigned to each authorized project purpose, but in addition, with respect to the power function, have an impact on financial feasibility since Reclamation law allows for the reassignment of any capital investment costs which are beyond the ability of the irrigators to repay to be reassigned for repayment to the preference power customers. Consequently, integrating any new costs associated with this new increment block, especially, if a potential for an irrigation cost reassignment opportunity exists, could add additional new financial burdens on the existing preference power customer base.

WAPA-6 Coupled with increased environmental regulatory oversight on the project (e.g., consultation on a new biological opinion, implementation activities associated with the San Joaquin River Restoration Program, the Central Valley Project Improvement Act implementation activities, bypass releases, as well as other Endangered Species Act consultations), it is more likely than not, that in the future, water and hydropower accomplishments for the project, even given this new project addition, will decrease, impacting the price competitiveness of the Federal hydropower product, as the per unit cost of the water and hydropower product from the project could increase.

WAPA-7 We noted with some interest that the report stated that existing hydropower facilities would need to be modified in order to enable them to continue to be able to take full advantage of the increased hydropower generation capability associated with each proposed project enlargement alternative.

WAPA-8 We understand the desire of Reclamation to move forward. However, as Reclamation finalizes its feasibility report and moves to the next step in the process, Reclamation may want to consider revisiting the various future alternatives to ensure that the assumptions used in the analysis continue to make sense, are still relevant, and are consistent with any real-time changes which may be occurring in any ongoing parallel regulatory processes.

WAPA-9 Particular attention may need to be paid to the economic and financial feasibility aspects of the project, as projected accomplishments are going to drive the ultimate decision as to whether to proceed with the project.

WAPA-9 CONTD

The viability of the project is contingent on project accomplishments and are going to be highly correlated to the various outcomes of the ongoing parallel processes that are currently underway. Consequently, when re-estimating benefit-cost ratios and attendant cost allocation and financial repayment responsibilities, Reclamation needs to ensure that it either has established a realistic environmental baseline on which to assess impacts, or in the alternative, to ensure that the baseline continues to make sense if a decision is made to move forward with this project.

Thank you for the opportunity to provide comments. We look forward to continuing to work and provide comments on your work products in the future.

Sincerely,

Sonja A Anderson

Sonja Anderson
Power Marketing Manager

Responses to Comments from Department of Energy, Western Area Power Administration

WAPA-1: Please see Master Comment Response COST/BEN-5, "Potential Project Financing." As described in COST/BEN-5, evaluations in the SLWRI Final Feasibility Report related to economic and financial feasibility, including preliminary cost allocation and potential water beneficiaries' payment capacities, were updated based on alternatives refinements and updated operational assumptions included in the SLWRI DEIS.

WAPA-2: Please refer to Master Comment Response GEN-1, "Comment Included as Part of the Record."

WAPA-3: Thank you for your comment related to historical CVP repayment and potential project beneficiaries' payment capacity. This comment will be included as part of the record and made available to decision makers before a final decision on the proposed project.

Please refer to Master Comment Response COST/BEN-5, "Potential Project Financing."

WAPA-4: Please refer to Master Comment Response GEN-4, "Best Available Information," and Master Comment Response ALTD-1, "Alternative Development – Water Supply Reliability."

WAPA-5: Thank you for your comment related to historical CVP repayment and potential project beneficiaries' payment capacity. This comment will be included as part of the record and made available to decision makers before a final decision on the proposed project.

Please refer to Master Comment Response COST/BEN-5, "Potential Project Financing."

WAPA-6: Please refer to Master Comment Response ALTD-1, "Alternative Development- Water Supply Reliability," and Master Comment Response ALTS-1, "Alternative Selection."

WAPA-7: Please refer to EIS Engineering Appendix for further information on potential modifications to hydropower under SLWRI project alternatives.

WAPA-8: Comment Noted. Section 32.7, "Next Steps," of Chapter 32, "Final EIS," discusses the next steps for SLWRI.

WAPA-9: As described in Chapter 3, "Considerations for Describing Affected Environment and Environmental Consequences," Section 3.2.3, "Methods and Assumptions," quantitative evaluations of beneficial and adverse effects of alternatives in the EIS, consistent with NEPA and CEQA guidelines, were based on two baselines:

- "Existing Conditions," based on a 2005 level of development and current facilities, as defined in 2012 (a 2005 baseline)
- "Future Conditions" based on without-project forecasted 2020-2030 level of development and reasonably foreseeable future projects and facilities (a 2030 baseline)[1]

Both the existing and future condition baselines include operational requirements in the 2008 OCAP BA, 2008 USFWS BO, and 2009 NMFS BO. Specific facilities and operational assumptions under each baseline are described in EIS Chapter 6, "Hydrology, Hydraulics, and Water Management," and the Modeling Appendix, Chapter 2, "CalSim-II."

Evaluations of direct and indirect effects in each resource area chapter (EIS chapters 4 through 25) are based on comparisons of with-project and without project conditions under both existing conditions and future conditions baselines, as well as comparisons of the No-Action Alternative to existing conditions.

[1] The level of development used for future conditions is a composite of multiple land use scenarios developed by DWR and Reclamation. The Sacramento Valley hydrology, which includes the Sacramento and Feather River basins, is based on projected 2020 land use assumptions associated with DWR Bulletin 160-98 (1998) and the San Joaquin Valley hydrology is based on the 2030 land use assumptions developed by Reclamation. Under any 2020 to 2030 level of development scenario, the majority of the CVP and SWP unmet demand is located south of the Delta, including the San Joaquin Valley. Please see Table 2-1 in the Modeling Appendix for additional information on CalSim-II modeling assumptions.

As described in COST/BEN-2, “Comments Related to the SLWRI Feasibility Report,” evaluations of economic and financial feasibility were not included in the DEIS, because they are not required under NEPA. However, estimated non-monetized benefits are presented in EIS Chapter 2, “Alternatives,” Section 2.3, “Action Alternatives,” and Section 2.5, “Summary of Potential Benefits of Action Alternatives.” Estimated non-monetized benefits presented in the DEIS were determined by comparison of the with-project condition to the No-Action Alternative, both under future conditions, consistent with the Federal planning process identified in the P&Gs.

Please refer to Master Comment Response COST/BEN-2, “Comments Related to the SLWRI Feasibility Report,” and Master Comment Response COST/BEN-5, “Potential Project Financing.”

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33.7 Comments from Tribes and Responses

This section contains copies of comment letters (and any attachments) from the tribes listed in Table 33.7-1. As noted previously, each comment in the comment letters was assigned a number, in sequential order (note that some letters may have more than one comment). The numbers were then combined with an abbreviation for the tribe (example: SICBI-1).

Responses to the comments follow the comment letters, and are also numbered, corresponding to the numbers assigned in the letters. The letters and associated responses are sorted alphabetically by abbreviation and appear in this section in that order.

Table 33.7-1. Tribes Providing Comments on Draft Environmental Impact Statement

Abbreviation	Tribe
BARR	Confederated Tribes of Coos, Lower Umpqua & Siuslaw Indians
SYBCI	Santa Ynez Band of Chumash Indians
UAICAR	United Auburn Indian Community of the Auburn Rancheria

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33.7.1 Confederated Tribes of Coos, Lower Umpqua & Siuslaw Indians

BARR

BISON CONNECT

SLWRI, BOR MPR <sha-mpr-slwri@usbr.gov>

Sacred Lands

1 message

Doug Barrett <DBarrett@ctclusi.org> Mon, Sep 30, 2013 at 9:04 AM
To: "BOR-MPR-SLWRI@usbr.gov" <BOR-MPR-SLWRI@usbr.gov>

BARR-1 Why does the government allow this to still happen to native people? If you allow this to happen, it will once again desecrate and bury the tribes land once again. In ten years or less, there will be 60 feet of contaminated sludge at the bottom of the

BARR-2 dam. Instead of removing that, you will build the dam higher? Why not take the existing sludge out for allot cheaper and truck it to the Umatilla dump site to cover the barrels of radioactive material already there? Someone needs to do what is right, don't build the dam higher! Make LA pay for their water and remove the

BARR-3 sludge caused by your dam and greed!
Again, please do the right thing!

Thank You,
Doug

Sent from my iPhone

Doug Barrett CADC 1, CPS
Confederated Tribes of Coos, Lower Umpqua & Siuslaw Indians
1245 Fulton Ave.
Coos Bay OR 97420

this email. You are hereby notified that any dissemination, misuse or copying or disclosure of the communication by a recipient who has received this message in error is strictly prohibited. If this message is received in error, please return this email to the sender and immediately highlight any error in transmittal. Thank You

Response to Comments from Confederated Tribes of Coos, Lower Umpqua & Siuslaw Indians

BARR-1: Please refer to Master Comment Response CR-1, "Potential Effects to Cultural Resources."

BARR-2: Please refer to Master Comment Response ALTD-1, "Alternative Development – Water Supply Reliability."

BARR-3: Please refer to Master Comment Response GEN-5, "Some People Support Dam Raise and Others Oppose Dam Raise."

33.7.2 Santa Ynez Band of Chumash Indians

SYBCI

Fw: Shasta Dam Comment Letter

Freddie Romero <freddyromero1959@yahoo.com> Mon, Sep 30, 2013 at 12:04 PM
Reply-To: Freddie Romero <freddyromero1959@yahoo.com>
To: "BOR-MPR-SLWRI@usbr.gov" <BOR-MPR-SLWRI@usbr.gov>

Ms. Chow,

I am resending this. I had the incorrect e-mail adress.

If you could confirm that you recieved this, I would very much appreciate it.

Freddie Romero
Cultural Preservation Consultant
SYBCI Elders Council
805-688-7997 X37
----- Forwarded Message -----
From: Freddie Romero <freddyromero1959@yahoo.com>
To: "SLWRI@usbr.gov" <SLWRI@usbr.gov>; Winnemem Wintu <winnememwintutribe@gmail.com>
Sent: Monday, September 30, 2013 10:45 AM
Subject: Shasta Dam Comment Letter

Ms. Chow,

I would like to submmit my comment letter for the record on the above mentioned proposed project.

Freddie Romero
Cultural Preservation Consultant
SYBCI Elders Council
805-688-7997 X4109
----- Forwarded Message -----
From: SYBMI Copier 1 <copier1@santaynezchumash.org>
To: freddyromero1959@yahoo.com
Sent: Monday, September 30, 2013 10:37 AM
Subject: Send data from MFP07309817 09/30/2013 10:37

Scanned from MFP07309817

Date: 09/30/2013 10:37
Pages: 4
Resolution: 200x200 DPI

DOC093013-09302013103752.pdf
141K

September 30, 2013

Ms. Katrina Chow, Project Manager
United States Bureau of Reclamation

Re: Shasta Damn Proposed Raising

Ms. Chow,

SYBCI-1

I would like to add my voice in support of opposition to this proposed project. The Winnemem Wintu tribe is a tribe that lived and occupied these northern lands for thousands of years. They have created a complete and complex society of sustainability within their territory.

The have created and designed their own government according to traditional values, religious and sacred practices, along with shrine and ceremonial sites, established villages with place names, food gathering and hunting locations, and cemeteries.

SYBCI-2

The Winnemem Wintu tribe is an indigenous group of individuals that is recognized by other indigenous nations within North America and is anticipating the formal re-recognition by the US government. But due to a lack of recognition by the US Government does not diminish the fact that the Winnemem Wintu has ties to these lands and established sacred and ceremonial areas that would be directly affected by this proposed project.

I would ask that your agency consider the following statement made by US Supreme Court Justice Brennan;

U.S. Supreme Court Justice Brennan in his dissent in LYNG v. NORTHWEST INDIAN CEMETERY PROT. ASSN., 485 U.S. 439 (1988) continues:

SYBCI-3

> In marked contrast to traditional Western religions, the belief systems of Native Americans do not rely on doctrines, creeds, or dogmas. Established or universal truths - the mainstay of Western religions - play no part in Indian faith. Ceremonies are communal efforts undertaken for specific purposes in accordance with instructions handed down from generation to generation. Commentaries on or interpretations of the rituals themselves are deemed absolute violations of the ceremonies, whose value lies not in their ability to explain the natural world or to enlighten individual believers but in their efficacy as protectors and enhancers of tribal existence. Ibid. Where dogma lies at the heart of Western religions, Native American faith is inextricably [485 U.S. 439, 461] bound to the use of land. The site-specific nature of Indian religious practice derives from the Native American perception that land is itself a sacred, living being. See Suagee, American Indian Religious Freedom and Cultural Resources Management: Protecting Mother Earth's Caretakers, 10 Am. Ind. L. Rev. 1, 10 (1982).

SYBCI-3 CONTD

Rituals are performed in prescribed locations not merely as a matter of traditional orthodoxy, but because land, like all other living things, is unique, and specific sites possess different spiritual properties and significance. Within this belief system, therefore, land is not fungible; indeed, at the time of the Spanish colonization of the American Southwest, "all . . . Indians held in some form a belief in a sacred and indissoluble bond between themselves and the land in which their settlements were located." E. Spicer, Cycles of Conquest: The Impact of Spain, Mexico, and the United States on the Indians of the Southwest, 1533-1960, p. 576 (1962).

SYBCI-4

As a federal agency and although the Winnemem Wintu does not have Federal Recognition status, under Sec106 the federal agency is still obligated to consult with them as a stakeholder CFR 36 part 800.2 (5)(1) Sec106 also states that in your ROD you need to show that adverse affects to cultural and heritage sites were mitigated. See the following;

(2) Record of Decision Must Mitigate any Impacts to Cultural Resources (copied from **http://www.npi.org/NEPA/impact)**

SYBCI-5

Once the EIS analysis has resulted in a draft environmental impact statement (DEIS), it is subjected to public and agency review, and comments are addressed – this may require further analysis. Then, assuming the project has not been abandoned, or so changed that a supplemental DEIS is needed, a final EIS (FEIS) is prepared and published. The FEIS is considered in making the agency's decision about whether and how to proceed with the action that was the subject of the EIS. This decision is recorded in a Record of Decision (ROD). According to 40 CFR 1505.2, the ROD must:

- State what the decision was.
- Identify all alternatives considered.
- Specify the alternative or alternatives considered to be "environmentally preferable." (Note that the agency does not have to select the environmentally preferable alternative, but it does have to discuss what it is.)
- Identify and discuss the factors balanced in making the decision (whether for or against the environmentally preferable alternative).
- State whether "all practicable means to avoid or minimize environmental harm . . . have been adopted, and if not, why they were not."

Having notified the world of its decision, the agency implements it. In doing so, it must carry out any mitigation, i.e., "means to avoid or minimize environmental harm," it has said in the ROD or EIS that it will carry out (40 CFR 1505.3).

SYBCI-6 The Winnemem Wintu Tribe has identified sacred sites and sustainability areas within the project area that would be directly affected by this proposed project significantly, negatively, and for the long term. Those impacts constitute a significant adverse impact and may require additional analysis prior to approval or permitting of this project. I would ask that this be carefully considered and that a decision not be hastily made.

I would ask that the Bureau of Reclamation consider President Obama's and ACHP's view for recognition of the UN Declaration of Rights of Indigenous Peoples;

SYBCI-7 In December 2010, the United States announced support for the **United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) and the ACHP in 2012**. In announcing this support, President Obama stated: "The aspirations it affirms—including the respect for the institutions and rich cultures of Native peoples—are one we must always seek to fulfill…[W]hat matters far more than any resolution or declaration – are actions to match those words." The UNDRIP addresses indigenous peoples' rights to maintain culture and traditions (Article 11); and religious traditions, customs, and ceremonies (Article 12); to participate in decision making in matters which would affect their rights (Article 18); and to maintain spiritual connections to traditionally owned lands (Article 25).

I would like you also to look at the connection between Sec106 and EO 13007 according to the ACHP;

The Advisory Council on Historic Preservation (ACHP) has explained
"The Relationship Between Executive Order 13007 Regarding Indian Sacred Sites and Section 106,"
http://www.achp.gov/eo13007-106.html

SYBCI-8

> To the extent that the requirements of the executive order and ACHP's regulations are similar, Federal agencies can use the Section 106 review process to ensure that the requirements of E.O. 13007 are fulfilled. For example, E.O. 13007 requires that agencies contact Indian tribes regarding effects and the Section 106 regulations require consultation with Indian tribes to identify and resolve adverse effects to historic properties.
>
> Consultation regarding the identification and evaluation of historic properties of religious and cultural significance to an Indian tribe could include identification of those properties that are also sacred sites. Similarly, consultation to address adverse effects to such historic properties/sacred sites could include discussions regarding access and ceremonial use.

SYBCI-9 The raising of this dam will also have a direct negative affect on the salmon population which has struggled since the inception and development of dams in this country, not to mention the economy. Efforts over the years and millions, if not billions of federal dollars, not to mention State dollars have been used in the recovering efforts of the salmon population.

SYBCI-10 This a 10 million plus dollar project that may end up cost the people of this country even more in the long run in jobs (due to impacts on fishing, sport and commercial), restoration, analysis, and recovery cost to offset the loss of salmon downstream from this project.

SYBCI-11 Without additional comments and Federal law being added and creating a convoluted letter, I ask that you agency would respect the Winnemem Wintu people and truly reconsider any approval of this proposal.

Sincerely,

Freddie R. Romero
Cultural Preservation Consultant
Santa Ynez Band of Chumash Indians
Elders Council
805-688-7997 X4109

Response to Comments from Santa Ynez Band of Chumash Indians

SYBCI-1: Thank you for your input. This comment will be included as part of the record and made available to decision makers before a final decision on the proposed project. A response to this comment is not required under NEPA because the comment does not raise a significant environmental issue (NEPA Regulations 40 CFR 1503.4). Many comment authors expressed personal opinions, histories or experiences which are not appropriately addressed as part of the NEPA process.

SYBCI-2: Please refer to Master Comment Response CR-2, "Federal Recognition." Chapter 14, “Cultural Resources,” describes the relationship of the Winnemem Wintu tribe with the Shasta Lake region including the use of sacred and ceremonial sites. Refer to Master Comment Response CR-1, “Potential Effects to Cultural Resources,” the Winnemem Wintu would be included in the consultation processes regarding potential effects and measures to avoid, minimize, or mitigate effects to these resources as discussed in Chapter 14, “Cultural Resources.”

SYBCI-3: Thank you for sharing your insights. This comment will be included as part of the record and made available to decision makers before a final decision on the proposed project. A response to this comment is not required under NEPA because the comment does not raise a significant environmental issue (NEPA Regulations 40 CFR 1503.4). Many comment authors expressed personal opinions, histories or experiences which are not appropriately addressed as part of the NEPA process.

SYBCI-4: Please refer to Master Comment Response CR-1, “Potential Effects to Cultural Resources,” Master Comment Response CR-2, “Federal Recognition,” and Master Comment Response CR-15, “National Historic Preservation Act Section 106 Consultations.”

SYBCI-5: Please refer to Master Comment Response CR-1, “Potential Effects to Cultural Resources,” and Master Comment Response CR-11, “Cultural Resources and NEPA.”

SYBCI-6: Please refer to Master Comment Response CR-1, “Potential Effects to Cultural Resources,” Master Comment Response CR-11, “Cultural Resources and NEPA,” and Master Comment Response CR-15, “National Historic Preservation Act Section 106 Consultations.”

SYBCI-7: Please refer to Master Comment Response CR-6, “United Nations Declaration on ‘The Rights of Indigenous Peoples.’”

SYBCI-8: Chapter 14, "Cultural Resources," of this Final EIS has been revised in response to comment to further describe Executive Order 13007.

Please refer to Master Comment Response CR-1, "Potential Effects to Cultural Resources," Master Comment Response CR-11, "Cultural Resources and NEPA," and Master Comment Response CR-15, "National Historic Preservation Act Section 106 Consultations."

SYBCI-9: Please refer to Master Comment Response DSFISH-3, "Fish Habitat Restoration," Master Comment Response DSFISH-5, "Fish and Wildlife Coordination Act Report," and Master Comment Response DSFISH-6, "Historic Dam Effects on Fisheries."

SYBCI-10: Effects to Chinook salmon, including beneficial effects, are discussed in EIS Chapter 11, "Fisheries and Aquatic Ecosystems," Section 11.3.3, "Direct and Indirect Effects." As described in the EIS, all action alternatives would generally result in improved flow and water temperature conditions for Chinook salmon in the upper Sacramento River downstream from Shasta Dam. This would benefit anadromous fish survival in the upper Sacramento River.

Please refer to Master Comment Response COST/BEN-1, "Intent of EIS and Process to Determine Federal Interest."

SYBCI-11: Thank you for your input. A response to this comment is not required under NEPA because the comment does not raise a significant environmental issue (NEPA Regulations 40 CFR 1503.4). Many comment authors expressed personal opinions, histories or experiences which are not appropriately addressed as part of the NEPA process. This comment will be included as part of the record and made available to decision makers before a final decision on the proposed project.

33.7.3 United Auburn Indian Community of the Auburn Rancheria

UAICAR

From: **Marcos Guerrero** <mguerrero@auburnrancheria.com>
Date: Mon, Aug 19, 2013 at 9:35 AM
Subject: Shasta Lake Draft EIS
To: "kchow@usbr.gov" <kchow@usbr.gov>
Cc: TribalpreservationDG <TribalpreservationDG@auburnrancheria.com>

Hello Ms. Chow,

UAICAR-1 In order to accurately assess the potential for your project to impact Native American resources I would like to take a look at the cultural resources inventory and management reports. This includes any survey, evaluation, or mitigation reports, include but not limited to PAs, MOA, HPTPs, and HPMPs.

Thanks you for your patience,

With respect,

Marcos Guerrero, RPA, THPO
Cultural Resources Manager
United Auburn Indian Community of the Auburn Rancheria
10720 Indian Hill Road
Auburn, CA 95603
Office: (530) 883-2364
Cell: (916) 300-8792
Fax: (530) 885-5476

Response to Comments from United Auburn Indian Community of the Auburn Rancheria

UAICAR-1: The Cultural Resources Technical Report is a confidential report of the EIS. Because the report contains sensitive information for other tribal entities this information cannot be provided. Chapter 14, "Cultural Resources," contains a summary of the information presented in the technical report. At this time Historic Properties Management Plans, Historic Properties Treatment Plans, Memorandums of Agreement, and Programmatic Agreements have not been developed. As discussed in Chapter 14 and Master Comment Response CR-1, "Potential Effects to Cultural Resources," additional NHPA Section 106 consultations will be initiated should an affirmative alternative be selected. Agreement documents will likely result from those consultations.

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