

Chapter 4

CUMULATIVE EFFECTS

This chapter addresses cumulative effects (CE) in the study area.

Of the numerous past, present, and reasonably foreseeable future actions identified in this cumulative effects analysis, the Truckee River Operating Agreement (TROA) is unique insofar as it relates to modifying reservoir operations. None of the other actions considered in this chapter has the objective, capacity, or legal authority to effect integrated management of major reservoirs in the Truckee River basin—specifically, rules for storing, exchanging, and releasing water. Some of the actions may, however, directly determine, to some degree, release schedules (amount and timing) for water stored pursuant to TROA (primarily Credit Water) based on water rights and beneficial uses, in addition to certain releases required for flood control, dam safety, and emergency purposes.

TROA is required by law to ensure that water is stored in and released from Truckee River reservoirs to satisfy the exercise of water rights in conformance with the *Orr Ditch* and *Truckee River General Electric* decrees, except for those rights that are voluntarily relinquished; much of the analysis in this document relates to water rights issues. TROA would allow latitude in reservoir operations and exercise of water rights within recognized institutional authorities (State water law, judicial decrees, etc.). In addition, TROA imposes no restrictions on urban planning or limitations on community development; rather, it is a tool for managing water resources in response to changing demands and conditions. Because no new water rights would be created by TROA and certain limitations on water use would be implemented, many of the cumulative effects of actions related to resources potentially affected by TROA are already presented in chapter 3. Some of these effects are repeated in this cumulative effects analysis to provide perspective on future conditions.

In the following analysis, identified potential future actions are grouped by category because they may affect the same water rights or water resources but to varying degrees depending on how they are exercised or distributed. In addition to those previously addressed effects, this analysis focuses on those past, present, and reasonably foreseeable future actions that would (1) cumulatively affect streamflows associated with beneficial uses or (2) develop water supplies in the study area.

I. Definition of Cumulative Effects

Council on Environmental Quality (CEQ) regulations implementing the National Environmental Policy Act (NEPA) define cumulative impacts 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 which agency (Federal or non-Federal) or person undertakes such actions (40 Code of Federal Regulations [CFR] section 1508.7).”

California Environmental Quality Act (CEQA) section 15355 defines cumulative impacts as follows:

Two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts:

- The individual effects may be changes resulting from a single project or a number of separate projects.
- The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.

This chapter briefly describes the major categories of actions in the study area that have a connection with TROA and their potential cumulative effects on affected resources. A connection with TROA is defined as an action that is:

- In the study area
- Affecting the use of Truckee River water
- Having environmental linkages to Truckee River operations

Section II describes the methodology used for the cumulative effects analysis. Section III identifies actions associated with Public Law (P.L.) 101-618. Section IV describes the U.S. Department of the Interior’s (Interior) Water 2025 initiative. Section V addresses the following seven action categories:

- **Urban development and land use:** Increasing populations increase demand for municipal and industrial (M&I) water and, as urban areas expand, agricultural lands are developed into residential and commercial properties.
- **Water rights acquisitions and transfers:** As demands for water for M&I, environmental, and water quality uses increase, acquisition of agricultural water rights continues.
- **M&I water plans:** Communities have developed and are developing water resources plans that address water rights transfers and groundwater use.

- **Ecosystem restoration:** Site-specific restoration projects are being implemented, and additional projects are likely to be implemented in the future.
- **Flood control:** Government entities are implementing flood control measures in portions of the study area.
- **Water quality:** Water quality standards have been developed and entities are taking actions to meet those standards.
- **Climate:** Seasonal water availability may shift due to climate change.

Section VI presents an analysis of the potential cumulative effects of each action category for each alternative and each affected resource (in the year 2033). Study area resources are analyzed using the same indicators and methodology presented in chapter 3. Finally, section VII presents a conclusion based on the analysis.

II. Methodology for Analyzing Cumulative Effects

This section describes the methodology for analyzing cumulative effects.

A. Identify Actions

Requests were sent to resource management agencies and other entities for information on ongoing, planned, or proposed actions related to water resources in the study area. Based on responses to the requests, more than 150 actions were identified as potential future actions to address in this cumulative effects analysis. Those actions were then differentiated as to those:

- Included in the operations model and related environmental analyses or considered as part of the past cumulative effects or current conditions. These actions are discussed in chapter 3, and are not considered further in this analysis.
- Meeting all of the criteria listed in section II.B and considered further in this analysis.

The Cumulative Effects Appendix lists all of the actions identified in the study area (identified with a CE reference number) and how they were addressed in the cumulative effects analysis.

B. Criteria

The following criteria were used to determine which of the more than 150 actions merited further analysis relative to cumulative effects:

1. Reasonably Foreseeable (Actions that are Likely to Happen)

CEQ regulations describe cumulative effects analysis in terms of “actions,” rather than “proposals.” Considering Cumulative Effects (page 19) states, “Commonly, analysts only include those plans for actions which are funded or for which other NEPA analyses are being prepared” (CEQ, 1997). This guideline was expanded to include actions for which positive responses to the following questions could be made:

- Is the action likely to occur?
- Does the action have an identified sponsor proposing it?
- Does the action have identified sources of funding?
- Has the action initiated NEPA compliance or other regulatory procedures?
- Is the action defined in enough detail to allow meaningful analysis?

2. Relevance (Actions that Relate to TROA)

Considering Cumulative Effects (page 19) also states, “In general, actions can be excluded from analysis of cumulative effects if the action will not affect resources that are the subject for the cumulative effects analysis.” Actions for which positive responses to the following questions could be made were included in the analysis:

- Does the action have aspects that are not already analyzed under the No Action Alternative (No Action)?
- Is the action defined in enough detail to determine if there would be any potential effect on indicators used in the analysis of the alternatives?
- Does the action affect any of the indicators used in the analysis of the alternatives?

3. Magnitude

Section 15130(a) of CEQA states, “An EIR (environmental impact report) shall discuss cumulative impacts of a project when the project’s incremental effect is cumulatively considerable.” Minor actions were not considered further; a minor action related to several similar actions was considered in the aggregate.

4. Determination

For the purpose of this analysis, implementation of TROA is considered significant if, in concert with other described past, present, or reasonably foreseeable future actions, it

would exacerbate the declining status of an identified resource (i.e., a resource that is already adversely affected) or create a condition in which an effect is initially minor but is part of an irreversible declining trend.

III. Actions Authorized by P.L. 101-618

Title II of P.L. 101-618, the Truckee-Carson-Pyramid Lake Water Settlement Act of 1990 (Settlement Act), was enacted by the Congress to provide the authorities and mechanisms for resolving a number of issues involving water resources and water rights in the Truckee and Carson River basins, among other matters, including negotiation of TROA. The purposes of Title II are detailed in chapter 1.

This section presents an overview of the status of selected actions authorized by Title II of P.L. 101-618 and the relation of each to TROA with regard to cumulative effects. (Note: Interstate water allocation [section 204] is related to TROA [section 205], the proposed action, and so is not analyzed separately.)

1. 206(a)(1) Water Rights Acquisition Program for Lahontan Valley Wetlands

Status: The U.S. Fish and Wildlife Service (FWS) released a final environmental impact statement (EIS) in September 1996 and a record of decision (ROD) in November 1996 that described and analyzed a program to purchase up to 75,000 acre feet of water from the Carson Division of the Newlands Project for Lahontan Valley wetlands Water Rights Acquisition Program (WRAP), as referenced earlier in this document (FWS, 1996). In addition to water rights, water needed to sustain the wetlands may come from water leasing, reservoir spills, irrigation drain water, water use reductions at Naval Air Station Fallon (NASF), groundwater pumping, or water purchases from segment 7 of the Carson River (upstream of Lahontan Reservoir).

Through a partnership of FWS, Nevada, The Nature Conservancy, Nevada Waterfowl Association (NWA), Bureau of Indian Affairs (BIA), and Bureau of Reclamation (Reclamation), about 34,400 acre-feet of water rights from the Carson Division have been acquired for Lahontan Valley wetlands as of June 2007: 23,800 acre-feet by FWS, 1,800 acre-feet by BIA, and 8,800 acre-feet by Nevada and NWA. Most purchases in the Carson Division have occurred at the edges of the Newlands Project near Stillwater NWR and Carson Lake. FWS has purchased 4,300 acre-feet from segment 7 of the Carson River and received 2,900 acre-feet from NASF. Water rights are purchased from willing sellers at appraised market value. Acquired water rights are currently transferred and exercised at Stillwater NWR at the consumptive use rate of 2.99 acre-feet per acre per year (compared to the entitlement of 3.5 and 4.5 acre-feet per acre per year for bottom and bench lands, respectively).

Potential Impacts: The WRAP ROD states, “The preferred alternative will result in the least amount of water rights purchased from the Carson Division. Under this alternative, the Service will rely more heavily on other water resources to fulfill the objective.” None

of the alternatives analyzed in this final EIS/EIR would affect the measures implemented to achieve the WRAP objective. To the extent that additional water rights are acquired, transferred, and exercised at the consumptive use rate, Carson Division demand would decrease accordingly and, in some years, reduce demand for Truckee River water, in accordance with Operating Criteria and Procedures (OCAP) for the Newlands Project. To the extent that reduced demand would increase flow in the lower Truckee River, TROA would provide opportunity to use such water to establish Credit Water to be managed for the benefit of Pyramid Lake fishes (i.e., cui-ui and Lahontan cutthroat trout [LCT]) and related resources. TROA in combination with this action would not, however, affect the exercise or priority of Newlands Project water rights, which would continue to be served consistent with OCAP, or the ability to divert water from the Truckee River to Lahontan Reservoir to achieve monthly storage targets.

2. 206(b) Expansion of Stillwater National Wildlife Refuge

Status: Stillwater National Wildlife Refuge (NWR) has made recommendations regarding expansion of its authorized boundary for acquiring an interest in land. The proposed revised boundary would incorporate the area formerly known as the Stillwater Wildlife Management Area (WMA), Fallon NWR, and 32 sections south and north of Stillwater WMA. Lands acquired within the expanded boundary would be managed to restore and maintain the natural biological diversity associated with the lower Carson River and its delta, the sand dune complex along the southern shore of the Carson Sink, and salt desert shrub lands of Carson Desert. A ROD has been completed. FWS recently approved a Comprehensive Conservation Plan (CCP) to guide the management of the expanded refuge. To date, there has been no legislative action on the proposed expanded boundary, and legislation appears unlikely at this time. CCP requires most of the refuge's water to be delivered during early summer rather than under an agricultural delivery pattern as in the past. The effect of such a delivery pattern on Pyramid Lake fishes has yet to be determined.

Potential Impacts: The only effect relative to TROA could be a modification of the water demand pattern, which could increase spring and early summer diversions from the Truckee River to achieve Lahontan Reservoir storage targets, in accordance with OCAP, and modify the storage and release pattern of water dedicated for the benefit of Pyramid Lake fishes if such management is not detrimental to Pyramid Lake fishes or trust resources of the Pyramid Lake Paiute Tribe of Indians (Pyramid Tribe). TROA in combination with this action would not, however, affect the exercise of Newlands Project water rights, which would continue to be served consistent with OCAP; TROA would not affect the priority of water rights or the ability to divert water from the Truckee River to Lahontan Reservoir to achieve monthly storage targets.

3. 206(c) Naval Air Station Fallon to Develop Land Use Management Plan

Status: NASF has developed a Land Use Management Plan for conserving water used on lands surrounding the air base. P.L. 101-618 requires transfer of any excess water rights identified in the plan to the Secretary of the Interior (Secretary) for the benefit of Pyramid

Lake fishes or wetlands in Lahontan Valley; as specified in section 207(e), such additional flows are intended to offset any reduction in flows attributed to the interstate allocation authorized in section 204. Though Pyramid Lake fishes would have priority to use this water for the conservation of the species in accordance with the ESA, such benefits from this excess water may not be realized until TROA is implemented, as specified in section 210(a)(2)(A). In the meantime, the excess water is being used on Stillwater NWR.

Potential Impacts: Disposition of this water may affect the amount and timing of water diverted from the Truckee River to the Newlands Project via the Truckee Canal in certain years. Such diversions or lack thereof would be coordinated to ensure maximum benefits for endangered and threatened species and wetland habitat and to avoid adverse impacts to trust resources of the Pyramid Tribe. TROA in combination with this action would not, however, affect the exercise of Newlands Project water rights, which would continue to be served consistent with OCAP; TROA would not affect the priority of water rights or the ability to divert water from the Truckee River to Lahontan Reservoir to achieve monthly storage targets.

4. 206(d) Interior and Nevada may Share Cost of Protecting Lahontan Valley Wetlands

Status: Status of agreement is uncertain.

Potential Impacts: This is a coordination action only and there would be no cumulative effect from implementation concurrent with TROA.

5. 206(e) Transfer of Carson Lake and Pasture to Nevada

Status: The Secretary is authorized to negotiate an agreement to transfer Carson Lake and Pasture to Nevada. The agreement to transfer the 30,000-acre wetland to Nevada was signed on October 28, 2004. The duty of water rights transferred to these wetlands will be 2.99 acre-feet per acre unless and until determined otherwise by the court in a final ruling.

Potential Impacts: The outcome of any final court ruling (3.5 versus 2.99 acre-feet per acre) could affect the timing and quantity of water diverted from the Truckee River to Lahontan Reservoir to achieve monthly storage targets. TROA in combination with this action would not, however, affect the exercise of Newlands Project water rights, which would continue to be served pursuant to OCAP; TROA would not affect the priority of water rights or the ability to divert water from the Truckee River to Lahontan Reservoir to achieve monthly storage targets. Such transfer would not affect the capacity to store, exchange, or release water from Truckee River reservoirs under TROA.

6. 206(f) Lahontan Valley and Pyramid Lake Fish and Wildlife Fund

Status: Net payments for storage of water in upstream Federal reservoirs (i.e., amounts in excess of Stampede Reservoir) will be deposited to the Lahontan Valley and Pyramid

Lake Fish and Wildlife Fund (LVPLFWF) for use on a 50/50 basis for (1) the Lahontan Valley wetlands restoration program and (2) protection and restoration of the Pyramid Lake fishery. The fund can also accept and fund projects from donations and projects funded by Nevada, although no such contributions have been received. The fund has been established, but deposits to date have been minimal and no related programs have been implemented. The amount of net payments under TROA will be the subject of future negotiations, but is expected to be positive (it is currently negative).

Potential Impacts: Within 2 years or so after TROA enters into effect, and subject to appropriations, additional funds likely would be available for restoration of Lahontan Valley wetlands and Pyramid Lake fishes. For Lahontan Valley wetlands, this restoration could take the form of physical restoration activities such as modifications of diking, installation of control structures, planting or removal of certain plants or animal species, and acquisition of water rights. In the case of water rights acquisitions, additional funds could potentially accelerate to some degree the rate of acquisition of water rights, but would not change the ultimate goal of 75,000 acre-feet of prime water rights available for the wetlands. For Pyramid Lake, funds could be used for such actions as fish spawning, rearing, stocking, placement, passage, research, and habitat improvement, including the acquisition of water rights. The amount of funding and the extent of acceleration are speculative at this time, and the extent of benefits or effects would depend on the magnitude of the fund as well as specific projects selected for funding. TROA would provide a mechanism to store Credit Water if, and to the extent, the fund were used to acquire water rights for the benefit of Pyramid Lake fishes.

7. 206(g) Transfer of Indian Lakes to Nevada or Churchill County

Status: The Secretary is authorized to negotiate an agreement to transfer Indian Lakes to Nevada or Churchill County. There is no proposal to implement this action.

Potential Impacts: TROA would not affect the transfer of Indian Lakes, and such transfer would not affect the capacity to store, exchange, or release Credit Water from Truckee River reservoirs under TROA.

8. 207(a) Develop and Implement Recovery Plans for Cui-Ui and LCT

Status: Recovery plans initially developed in early-mid 90s. FWS intends to create a new plan for both species; LCT Short-Term Action Plan for Truckee River has been approved.

Potential Impacts: FWS is testing water management options and recovery objectives, including the 6-flow regime for cui-ui and LCT. TROA would provide a mechanism to store, exchange, and release Credit Water to assist in achieving identified flows for the benefit of Pyramid Lake fishes.

9. 207(b) Incorporate Truckee River Rehabilitation Plan into U.S. Army Corps of Engineers Reconnaissance Level Study

Status: Pyramid Tribe and U.S. Army Corps of Engineers (COE) are still negotiating the plan. Because no specific actions have been identified, no CE analysis is necessary.

Potential Impacts: Several plans have been proposed over the years, but none has been adopted or financed. TROA would provide a mechanism to store, exchange, and release Credit Water to assist in achieving identified flows for the benefit of Pyramid Lake fishes, which could be coordinated with other flow requirements for the lower Truckee River.

10. 207(c) Water Acquisition Program for Cui-ui and LCT

Status: No specific acquisition program has been developed.

Potential Impacts: Were a specific acquisition program proposed, TROA would provide a mechanism to store, exchange, and release Credit Water for the benefit of Pyramid Lake fishes to the extent water rights were acquired for that purpose. However, no such acquisition program is currently proposed or planned.

11. 208(a)(2) Pyramid Lake Fisheries Fund

Status: Established in the early 1990s (\$25 million). Interest used to operate and maintain Tribal fishery program.

Potential Impacts: Feedback from operation of Tribal fishery program could be incorporated in the flow regime selection process to develop flows for the lower Truckee River to benefit Pyramid Lake fishes.

12. 208(a)(3) Pyramid Lake Paiute Economic Development Fund

Status: \$40 million was appropriated for the fund (during 1993-97). Fund may not be used until TROA is implemented. A plan for using the fund has not been developed.

Potential Impacts: To the extent that management of Credit Water under TROA would benefit Pyramid Lake fishes and lower Truckee River riparian habitat, plans could be developed to capitalize on those benefits using a portion of the development fund.

13. 209(a) Expansion of Newlands Project Purpose

Status: In addition to agriculture, Newlands Project may also be operated for fish and wildlife, M&I, recreation, and water quality with valid water rights.

Potential Impacts: No new water rights or additional demand would be created by this provision, and no additional environmental effects relative to TROA would be expected from this provision in the absence of any specific proposal.

14. 209(b) Project Efficiency Study

Status: Reclamation completed this study in 1994.

Potential Impacts: No CE analysis required because this was a study only and no action has been proposed.

15. 209(d) Water Banking

Status: Potential development of agreements to allow project water right holders to carry over water for drought protection.

Potential Impacts: No CE analysis required because no water banking program is proposed or planned.

16. 209(e) Recreation Study

Status: Potential study to identify measures to benefit recreational use of Lahontan Reservoir and downstream.

Potential Impacts: No CE analysis required because no study has been planned.

17. 209(f) Effluent Reuse Feasibility Study

Status: Potential study of application of sewage effluent on refuges and wetlands.

Potential Impacts: No CE analysis required because no study has been planned.

18. 209(h) Settlement of Claims (Recoupment)

Status: On February 16, 2005, the United States District Court for the District of Nevada entered a judgment in favor of the United States and the Pyramid Tribe, and against Truckee-Carson Irrigation District (TCID), for the repayment of 197,152 acre-feet of water to the Truckee River in equal installments over twenty years, at 2 percent interest in kind on the unpaid balance. At the time of publication of this final EIS/EIR, appeals of this judgment to the United States Court of Appeals for the Ninth Circuit were pending. In the meantime, the Federal Water Master is supervising, under direction from the District Court, the implementation of the judgment.

Potential Impacts: No CE analysis is required because the implementation of a judgment is not an action subject to NEPA or CEQA. TROA would not affect the implementation of the judgment, and no effects relative to TROA would be expected.

19. 209(j) OCAP

Status: Regulations governing long-term operations of the Newlands Project (43 CFR part 418) were revised most recently on December 18, 1997. Environmental analysis of

implementation of OCAP was addressed most recently in the EIS for the Newlands Project Proposed OCAP (Reclamation, 1987) and the Environmental Assessment for Newlands Project Proposed OCAP (Interior, 1997).

Potential Impacts: TROA would not affect the priority of Newlands Project water rights, calculation of Newlands Project maximum allowable diversion, or the ability to divert water from the Truckee River to Lahontan Reservoir to achieve OCAP monthly storage targets; therefore, it would have no significant cumulative effect on implementation of OCAP. No modification would be required to accommodate implementation of Newlands Project Credit Water (NPCW) as described in TROA. No significant impacts to the Newlands Project would be anticipated because any future modification to OCAP would be required to be consistent with its guiding principles, including providing “water deliveries sufficient to meet water right entitlements of Project water users.” The effects of NPCW implemented in conjunction with OCAP for current conditions and alternatives including TROA are analyzed in sections F and H in “Surface Water” in chapter 3.

20. 210(a) Claim Settlement

Status: A number of actions are interdependent with the effectiveness of TROA:

- Dismissal of water claims or other resolution is a prerequisite for implementing other actions associated with P.L. 101-618.
- TROA must be approved before several actions may take place (section 204; section 206(c); section 207(c) and (d); and section 208(a)(3)).
- Section 204 and TROA may not take effect until the Pyramid Tribe’s claim to the remaining waters of the Truckee River has been resolved.

Potential Impacts: No additional cumulative effects beyond those described in the analysis in this section would be expected from this action.

21. 210(b)(2) Management of Anaho Island

Status: The Pyramid Tribe and FWS reached an agreement in early 1990s.

Potential Impacts: TROA would provide a mechanism to store, exchange, and release Credit Water to assist in achieving identified flows for the benefit of Pyramid Lake fishes, which could be coordinated with management of Anaho Island to benefit indigenous biological resources.

22. 210(b)(3) Beds and Banks of the Lower Truckee River

Status: Nevada and the Pyramid Tribe reached an agreement on ownership in early 1990s.

Potential Impacts: This action would not affect the exercise of water rights, and no effects relative to TROA would be expected.

23. 210(b)(16) Address Water Purchase Impacts to Domestic Uses of Groundwater

Status: The Secretary, in consultation with Nevada and affected local interests, is directed to undertake appropriate measures to address significant adverse impacts, identified in studies authorized by the Settlement Act, on domestic uses of groundwater directly resulting from water purchases authorized by the Settlement Act. The only water purchases to date authorized by the Settlement Act have occurred pursuant to section 206(a); that purchase program was analyzed in the WRAP EIS, which found that there would be no significant adverse impacts on domestic uses of groundwater in Lahontan Valley. Since the WRAP EIS was published, the U.S. Geological Survey (USGS) has continued to study groundwater in Lahontan Valley, and no significant adverse impacts on domestic uses of groundwater have been identified from the WRAP program. USGS has published the following related studies: Nora B. Herrera, Ralph L. Seiler, and David E. Prudic, *Conceptual Evaluation of Ground-Water Flow and Simulated Effects of Changing Irrigation Practices on the Shallow Aquifer in the Fallon and Stillwater Areas, Churchill County, Nevada*, USGS Water-Resources Investigations Report 99-4191 (2000); Patrick A. Glancy, *Geohydrology of the Basalt and Unconsolidated Sedimentary Aquifers in the Fallon Area, Churchill County, Nevada*, USGS Water-Supply Paper 2263 (1986); Michael S. Lico and Ralph L. Seiler, *Ground-Water Quality and Geochemistry, Carson Desert, Western Nevada*, USGS Open-File Report 94-31 (1994); and Douglas K. Maurer, Ann K. Johnson, and Alan H. Welch, *Hydrogeology and Potential Effects of Changes in Water Use, Carson Desert Agricultural Area, Churchill County, Nevada*, USGS Water-Supply Paper 2436 (1996).

Potential Impacts: Because no significant adverse impacts to domestic uses of groundwater have been identified for this action authorized by the Settlement Act, no measures to address such impacts have been proposed, and there is, therefore, no action to consider in conjunction with TROA. The effects of TROA in conjunction with WRAP was also addressed previously in section III (1), 206(a)(1) “Water Rights Acquisition Program for Lahontan Valley Wetlands.

24. 210(b)(18) Exchange of Public Lands for Interests in Land and Water Rights

Status: Authorizes the Secretary to exchange public lands in Nevada for interests in land and water rights within or next to the Pyramid Tribe’s reservation. No land or water rights exchange program is proposed or planned.

Potential Impacts: No CE analysis required because no land or water rights exchange program is proposed or planned.

IV. Water 2025 Initiative

Water 2025 is an Interior problem-solving initiative being developed to address water conflicts. Water 2025 will encourage voluntary water banks and other market-based measures, improve technology for water conservation and efficiency, and remove institutional barriers to promote cooperation and collaboration among Federal, State, Tribal, and private organizations (CE#: GS-TN-1). Reclamation has several ongoing initiatives within the study area primarily focused on more efficient management of water and improved technology.

Truckee-Carson Irrigation District/Fernley: Automation of Gilpin Wasteway - Automate 3 of 5 gates and implement telemetry at Gilpin Wasteway to improve the operations of the Truckee Canal, especially in emergency situations if a breach occurs.

Desert Research Institute (DRI): Carson River Optimization: Develop a forecasting model applicable to water management issues in the Carson River. The product is an integrated model that includes a hydrologic model of the Carson River above Genoa and a channel routing model of the Carson River from Genoa to Fort Churchill.

DRI - Truckee Canal Automation: Develop and evaluate a methodology for automation of check and diversion structures along the Truckee Canal. The expected product is a model of automated operations including equipment specifications and water quantity/quality effectiveness study.

DRI: Several projects are proposed to optimize Truckee River operations based on TROA:

- Studies of real time hydrologic data acquisition, storage and usage to improve water supply and use inputs to the Decision Support System (DSS).
- Identify and quantify return flows to the Truckee River to improve the return flow data inputs into the collaborative DSS.
- Development, testing, and implementation of tools to optimize the operations of the Truckee River using high resolution estimates of hydrologic variables from National Weather Service and National Aeronautics and Space Administration data products.
- Development, testing, and implementation of tools to provide operational guidance to Reclamation streamflow forecasters aimed at optimizing the operations of the Truckee River.

Potential Impacts: The potential for increased water delivery and distribution efficiency, improved real-time forecasting, and improved water management facilities could lead to

water savings. Any such water savings would provide additional opportunities to create and store Credit Water under TROA that could be managed to provide benefits to aquatic and riparian resources as well as to the water owner.

V. Effects of Other Water Resource-Related Actions

Many proposed and potential future actions related to water resources were identified for this part of the cumulative effects analysis. As noted previously, however, only a small portion of these actions would relate to or directly affect water management or reservoir operations in the study area. Therefore, only the most reasonably foreseeable future water-resource related actions or group of actions are described under each of the seven action categories. As appropriate, modeling of these actions or groups of actions for the chapter 3 analysis is discussed. In addition, a brief assessment of the potential individual effect of each action on affected resources (as identified in chapter 3) is presented, followed by an assessment of the effect of the action on resources in conjunction with TROA (i.e., cumulative effect). This information is then used in section VI to evaluate more broadly the cumulative effects of the action categories relative to the alternatives and affected resources (in the year 2033).

A. Urban Development and Land Use Changes

Local populations are increasing in the study area, primarily in urban areas. Urban areas (e.g., Truckee, Truckee Meadows, and Fernley) are expanding and encroaching on rural areas. Some of the urban development is occurring in “rural areas,” which are developing into satellite commuter communities. Some recreation-based areas (e.g., ski resorts) also are expanding. This urban development has caused a broad range of infrastructure and land use changes affecting wastewater treatment, transportation, water quality and rehabilitation drainage, and recreation sites. As urban areas expand, agricultural lands are developed into residential and commercial properties. Modeling addresses land use changes indirectly, as these changes may affect water quality and quantity and timing of flows. Water quality (point and nonpoint source pollution) is incorporated in the Watershed Analysis Risk Management Framework (WARMF) model (projected through the year 2020) and is addressed in “Water Quality” in chapter 3. Narrative treatment of development and land use is presented in “Social Environment” In chapter 3.

1. Urban Development Plans

Cities and counties in California and Nevada have urban development plans to accommodate future development, including the following:

- The Martis Valley, California, Community Plan projects that the portion of the plan area identified in the Placer County final EIR (including more than 6,000 homes and infrastructure) could be 37 to 53 percent fully developed by 2020 (CE#: UD-TC-3).

- The town of Truckee, California, General Land Use Development Plan, proposes to redevelop the downtown area, subdivide undeveloped areas into lots between ½ and 10 acres, and develop other sections at 6-12 dwelling units per acre. The Truckee-Donner Public Utility District Master Water Plan takes into account development identified in the General Plan.
- The draft 2002 Truckee Meadows, Nevada, Regional Plan projects 35 percent of the development will be in the already urbanized area within the McCarran Boulevard “beltway,” and no more than 64 percent will be outside McCarran Boulevard. The 5-year revision of this plan is in process (CE#: UD-LT-1, UD-TC-1, UD-TC-2, UD-TC-3, UD-TN-1).
- Numerous development projects (e.g., aggregate pits, buildings, residential units) are proposed for unincorporated areas, for example, on lands along the Truckee River in Storey County, Nevada (CE#: UD-TN-5).
- The Pyramid Tribe has drafted an Overall Economic Development Plan that anticipates continued development in the Wadsworth, Sutcliffe, and Nixon, Nevada areas. This draft plan includes the Wadsworth Master Plan for Drinking Water and Wastewater Treatment and will include feasibility studies for Sutcliffe and Nixon.

Potential Impacts: TROA would have no direct effect on community planning activities. Additional impervious surfaces would increase urban stormwater runoff; change runoff patterns and amounts from lawn irrigation and other urban uses; increase discharge of pollutants from development, domestic land uses, roads, and commercial facilities; and reduce groundwater recharge. With increased discharges, wastewater treatment facilities would still be required to meet water quality standards. Additional sources of water could be required to supplement the lower Truckee River flow to maintain or enhance water quality and riparian and riverine habitat.

TROA would provide opportunities to store and release water dedicated for water quality use directly within defined criteria. Other water, particularly that dedicated for Pyramid Lake fishes, indirectly could provide similar water quality benefits. TROA would not, however, affect the direction or strategy of local planning agencies or the implementation of development plans.

2. Transportation Improvements

Several projects are proposed for the Lake Tahoe and Truckee River basins to improve transportation by rehabilitating or widening roads, with possible rehabilitation of drainage.

Potential Impacts: Widening roads or increasing impermeable surfaces may change the magnitude and timing of runoff. Road and drainage rehabilitation could affect water

quality by reducing or increasing pollutant loads. Intercepting and consolidating drains could allow for water treatment or could become a point source for pollution. These actions may potentially degrade water quality with or without TROA; conditions that arise as a result of precipitation or runoff events would be outside the water management capabilities of TROA.

3. Ski Resorts

Operations and facilities are likely to expand at ski resorts, such as Squaw Valley (CE#: SR-TC-1) and Mount Rose/Slide Mountain (CE#: SR-TN-1).

Potential Impacts: Snowmaking, pond expansion, and increased water demands would increase local groundwater and surface water use as well as facilities for water treatment and disposal. TROA would contain provisions related to accounting for water used for snowmaking but would have no direct effect on ski resort operations.

B. Water Rights Acquisitions and Transfer

Demands for water to meet recovery objectives for threatened and endangered species and to meet the recreational and M&I demands of an increasing population are increasing. These increased demands are being met by acquiring agricultural water rights. As agricultural water rights are acquired and transferred and lands are taken out of production, there are fewer irrigated acres in the Truckee River basin, and the associated agricultural demand is decreasing.

A number of measures could be implemented individually or collectively to promote efficient use of irrigation water on remaining agricultural lands in the basin. Improved efficiency would reduce diversions from the Truckee River and increase water availability for other beneficial uses, including river flow and discharge to Pyramid Lake. The list of possible measures includes the following:

Technical

- Employing land leveling to allow more uniform application of water to flood-irrigated fields
- Installing surge irrigation to improve water distribution
- Using sprinklers to allow more uniform application of water to flood-irrigated fields
- Installing low-energy, precision application sprinklers to reduce evaporation and loss from wind drift

- Using furrow diking to promote soil infiltration and reduce runoff
- Using drip irrigation to reduce evaporation

Managerial

- Improving irrigation scheduling and operations
- Applying water when most crucial to crop yield
- Using water-conserving tillage and field preparation methods
- Improving canal and equipment maintenance
- Recycling drain and tail water

Institutional

- Reducing irrigation subsidies and/or introducing conservation-oriented pricing
- Fostering rural infrastructure for private-sector dissemination of effective technologies
- Improving training and extension efforts

Agronomic

- Selecting crop varieties with high yields per volume of transpired water
- Intercropping to maximize use of soil moisture
- Matching crops to climate and water availability
- Sequencing crops to maximize production
- Selecting drought-tolerant crops
- Modeling for water rights acquisitions assumes that the pending water rights in California are limited to the allocation amount for TROA and a greater amount for No Action and the Local Water Supply Alternative (LWSA), and that inactive Newlands Project water rights are retired in accordance with current State law (Assembly Bill [AB] 380).

1. California Surface Water Rights Applications

Surface water rights applications are active before the California State Water Resources Control Board (SWRCB). There are 11 applications with a total face value of 56,612 acre-feet in the Lake Tahoe basin and 11 applications with a total face value of 17,715 acre-feet in the Truckee River basin (CE#: WS-LT-2 and WS-TC-1).

Potential Impacts: In California, current surface water and groundwater use is 18,700 acre-feet in the Lake Tahoe basin and 10,370 acre-feet (of which 2,800 acre-feet is surface water use) in the Truckee River basin. The operations model assumes that, under TROA, California future water use will be 23,000 acre-feet in the Lake Tahoe basin and 22,700 acre-feet (of which 4,300 acre-feet is surface water use) in the Truckee River basin. In both basins, the water rights applications exceed projected use in 2033. Use of additional surface water rights (i.e., beyond those modeled for future conditions) could further affect the magnitude and timing of diversions from the Truckee River; the degree of the effect would depend on the amount granted. If these applications were granted and the water consumptively used, Truckee River water supplies could be affected, increasing the effects of drought and reducing water supply in the Nevada portion of the basin as well as the Newlands Project and Lahontan Valley wetlands. The elevation of Pyramid Lake would further decline, and Pyramid Lake fishes would be further jeopardized.

While it is reasonable to assume that SWRCB would approve some additional applications in the absence of TROA, it is unlikely to approve all of the applications. The interstate allocation caps the total water use in California at 23,000 acre-feet in the Lake Tahoe basin and 32,000 acre-feet (of which no more than 10,000 acre-feet may be surface water) in the Truckee River basin. In the Nevada portion of the Lake Tahoe basin, usage is assumed to be limited to the allocation amount of 11,000 acre-feet under both current and 2033 conditions. See chapter 2.

2. Assembly Bill 380

Nevada established the AB 380 program to resolve protests associated with Newlands Project water rights under challenge on grounds of forfeiture or abandonment, with the objective of retiring 6,500 acres of such water rights. A Finding of No Significant Impact (FONSI) for AB 380 was signed by Reclamation on September 12, 2000. The program expired on June 30, 2006, and, while the 6,500-acre objective was not achieved, the program did permanently retire approximately 4,580 acres (CE#: GS-TN-8).

Potential Impacts: TROA would have no adverse cumulative effect on this program. To the extent that reduced demand for the Newlands Project would increase flow in the lower Truckee River, TROA would provide opportunity to use such water to establish Credit Water to be managed for the benefit of Pyramid Lake fishes and related resources. TROA in combination with this action would not, however, affect the exercise or priority of Newlands Project water rights, which would continue to be served consistent with OCAP, or the ability to divert water from the Truckee River to Lahontan Reservoir to achieve monthly storage targets.

3. Desert Terminal Lakes

In 2002, P.L. 107-171, the Farm Security and Rural Investment Act of 2002 (Farm Bill) was passed by Congress. Section 2507 of P.L. 107-171 (Desert Terminal Lakes) and subsequent clarifying legislation appropriated \$200 million to Reclamation for the purpose of providing water to the at-risk desert terminal lakes of Pyramid, Summit, and Walker in Nevada. The legislation stated that “funds shall. . .be used. . .to provide water to at-risk natural desert terminal lakes” and that the funds cannot be used to purchase or lease water rights.

a. Truckee River Restoration Projects

Truckee River Restoration Projects implemented by Reno, The Nature Conservancy, Sparks, Washoe County, and Bureau of Land Management (BLM). In addition to the project work described below, this project includes the transfer of 250 acre-feet of water to the river. An approved secondary water right on the reclaimed water from the Truckee Meadows Water Reclamation Facility (TMWRF) allows for land application of up to 6,700 acre feet. Based upon a State Engineer ruling, this is the average amount of water pumped from groundwater wells in Truckee Meadows that goes to TMWRF through the waste stream. The groundwater component is not required to be placed in the Truckee River. Consequently, this portion of the reclaimed water is approved for irrigation projects (golf courses, grass hay production and landscaping) in Truckee Meadows.

The cities recognize that more water in the river is needed downstream from Derby Diversion Dam to improve aquatic habitat. At least 250 acre-feet of this groundwater component is to be dedicated for release to the Truckee River. The cities will seek a change in the place of use for the TMWRF groundwater component to the Truckee River and Pyramid Lake. The beneficial use for this water in the Truckee River will become a nonconsumptive use, which will ensure that the water will benefit the river and flow to the lake. The intent is to augment river flow during a 3-month period from August to October when Truckee River water is being diverted at Derby Diversion Dam to the Truckee Canal in accordance with OCAP.

Potential Impacts: A program to enhance water supplies to desert terminal lakes could provide more water in the lower Truckee River to flow to Pyramid Lake. The opportunity for more water to Pyramid Lake could provide additional opportunities to create and store Credit Water under TROA that could be managed to provide benefits to aquatic and riparian resources in Pyramid Lake as well as the length of the Truckee River (i.e., from the point of release to discharge to Pyramid Lake).

b. Channel-and-Flood Plain Restoration at Mustang, 102 Ranch, and Lockwood

This restoration entails excavating new meanders to restore sinuosity, decrease slope and reconnect the river to the flood plain. It also entails re-creation of oxbow wetlands that once existed but were lost to various human activities. Riffles will be constructed in the channel using rock brought to the sites. Following construction, an intensive revegetation

effort will be implemented using native plants. Following the replanting effort is a 3-year plant establishment period of intensive irrigation, weed and herbivory control, and general maintenance of the revegetation area.

Potential Impacts: This type of restoration will yield a broad array of ecosystem benefits to aquatic and terrestrial species, including key fish and bird species. It will improve water quality and indirectly enhance flows to Pyramid Lake. TROA would provide a mechanism to store, exchange, and release Credit Water to assist in achieving identified flows for the benefit of lower river aquatic and riparian habitat, which could be coordinated with other flow requirements for the lower Truckee River.

c. Below Derby Low Flow Channel

The project is to augment the fishway at Derby Diversion Dam by providing a continuous geomorphically correct, riparian-canopy shaded, low-flow channel in the Truckee River below the fishway. The purpose of the low-flow channel with shade canopy downstream from Derby Diversion Dam is to enhance the aquatic and riparian habitats by improving fish access and water quality and increasing the amount of riparian canopy.

Potential Impacts: The proposed project may result in lowering water temperatures, which will reduce evaporative losses in these reaches of the river and increase dissolved oxygen, thus resulting in higher quality habitat for fish and aquatic organisms. These benefits will be realized most during low flow conditions. The project is also expected to increase species richness as a result of increasing the riparian canopy. TROA would provide a mechanism to store, exchange, and release Credit Water to assist in achieving identified flows for the benefit of Pyramid Lake fishes and lower river riparian habitat, which could be coordinated with other flow requirements for the lower Truckee River. Feedback from operation of this project, along with the Derby Diversion Dam fish passage facility, could be incorporated in the flow regime selection process to develop flows to provide further benefits to biological resources.

d. Pyramid Lake Fisheries Hatchery Water Use Recovery

Pyramid Lake Fisheries operates and maintains five hatcheries dedicated to its fish recovery program. Pyramid Lake Fisheries pumps approximately 5 million gallons per day through its hatcheries during the 11-month fish growing season (April–February). The hatcheries use an unusual recycling system that removes and converts waste products; but after two to four passes, the water becomes unsuitable for fish, mainly due to loss of oxygen. This water is then diverted to large evaporation ponds, or in one case, evaporation ponds leading to a constructed wetland on the river.

The purpose of this project is to provide more water to Pyramid Lake by increasing hatchery water use efficiency and completing small-scale restoration to Hardscrabble Creek as a means to deliver recovered water to Pyramid Lake. This project will increase the number of times the same water can be used and divert the treated water back to the lake directly or to the lake via Hardscrabble Creek. Water savings result by reducing

water pumped from the shallow aquifer that would then move to the lake (result of increasing the number of times the water can be used), and saving water that would otherwise be evaporated and sending that water to the lake. Estimated water savings are 890 acre-feet per year.

Potential Impacts: By providing additional water to Pyramid Lake, the cumulative effect of this beneficial project would add to the beneficial effects of TROA for Pyramid Lake fishes. A reduced or eliminated diversion to the constructed wetland would diminish its value for wetland-associated species, but would be offset to some degree by the restoration of Hardscrabble Creek. This project would not substantially affect the beneficial effects of TROA on riparian and wetland habitats.

C. M&I Water Demand

M&I demands include municipal, industrial, commercial, power, and mining. The study area in California and Nevada has seen substantial increases in population, residential development, and commercial and industrial projects in recent years, and this trend is expected to continue. M&I demand for water increases as the population increases. Conservation measures to reduce per capita demand and extend water supplies are being implemented and are expected to expand in the future. The operations model includes M&I demands associated with projected populations for the year 2033 and amounts supplied by surface and groundwater sources. See “Surface Water” in chapter 3.

1. M&I Water Plans and Projects

a. Coldstream Canyon, California

This project involves development of a water extraction facility for bottled water in Coldstream Canyon, California. Wells and permit are in place (CE#: WS-TC-3). The project has been dormant for several years, and Placer County Planning Agency has asked the proponent to withdraw the proposal.

Potential Impacts: This project could reduce flow in Cold Creek, a tributary to Donner Creek downstream from Donner Lake. Minimum releases from Donner Lake are 2 or 3 cubic feet per second (cfs), depending on the flow from Cold Creek. Reduced flow in Cold Creek could lead to the higher minimum release requirement, which would result in a slight reduction in Donner Lake storage (a release of 1 cfs for 90 days is 178 acre-feet), which may affect local recreation. There would be no cumulative effect of this action implemented concurrent with TROA.

b. Fernley, Nevada

The city of Fernley is proposing to construct a water treatment plant beginning January 2008 to treat groundwater from city wells. This water will be treated to remove arsenic by January 2009 to comply with the Environmental Protection Agency’s (EPA) Arsenic Rule. The plant will be located on city property and will have an initial capacity

of 20 million gallons per day with space provided to expand to 30 million gallons per day. Treated water will be stored in 1.5-million-gallon clear tanks for distribution. Future plans include surface water treatment at this plant (CE#: WS-TN-5).

Potential Impacts: Depending on the method selected for delivery of water to satisfy the exercise of acquired Truckee Division water rights, the amount and timing of water diverted from the Truckee River to the Truckee Canal could be affected, which could, in turn, affect opportunities to create and store Credit Water under TROA that could be managed to provide benefits to aquatic and riparian resources as well as to the water owner. To the extent that such water may be Credit Stored for Fernley, it would be managed and released to satisfy Fernley's increasing M&I water demand. Also, see Section G, "Optional Scenarios," in "Surface Water" in chapter 3.

c. Pyramid Lake Indian Reservation, Nevada

The Pyramid Tribe has drafted an Overall Economic Development Plan that includes plans to improve municipal water systems in Nixon, Sutcliffe, and Wadsworth, Nevada. Included in the plan is the Wadsworth Master Plan for Drinking Water and Waste Water Treatment. The Pyramid Tribe is awaiting Public Utility authority before proceeding. A water feasibility study for Nixon and Sutcliffe also will be included in the overall plan.

Potential Impacts: TROA would have no direct adverse cumulative effect on development of local water systems, though water management options under TROA that benefit riverine and riparian habitat in the lower Truckee River could provide indirect benefits to water quality and quantity. Feedback from operation of this project, along with other flow-related projects, could be incorporated in the flow regime selection process to provide further benefits to biological resources. Improvements to rural water systems would benefit groundwater and surface water resources.

d. Churchill County, Nevada

The *Final Report, Churchill County Water Resource Plan: 25 Year 2000-2025: 50 Year 2000-2050* (Water Research & Development, Inc., 2003) recommends, in part, the following measures (CE#: WS-LV-1):

- Continue use of historic groundwater resources for quasi-municipal development
- Continue to require new quasi-municipal development to provide water rights as per the county water right dedication ordinance
- Require new quasi-municipal development to provide appropriate water and wastewater systems, and dedicate them to the county
- Establish a utility division within Churchill County to operate the newly created water and wastewater system

- Establish processes and procedures to acquire and operate private water and wastewater systems

In its *Final Water Resource Plan Update* (2007), Churchill County identifies ownership and operation of a small community water system and construction of a larger county system to replace other smaller systems. Also, it affirms reliance on local groundwater from Newlands Project recharge to support near-term urban development and its objective to acquire and import groundwater from Dixie Valley to meet its long-term M&I water demands. The *Churchill County Water Resource Protection Policy* (December 7, 2006) is intended to ensure a long-term local water supply through management of resources and protection of water rights.

Potential Impacts: TROA would have no direct effect on development of local water systems or on water rights on the Newlands Project. TROA would not affect the exercise of Newlands Project water rights, which would continue to be served consistent with OCAP; TROA would not affect the priority of water rights or the ability to divert water from the Truckee River to Lahontan Reservoir to achieve OCAP monthly storage targets. Any changes in Newlands Project water demand occasioned by M&I water development could affect diversions to the Truckee Canal and opportunities to store Credit Water, which could, in turn, affect related benefits for Pyramid Lake fishes and the lower Truckee River. Water importation should have no effect on Truckee River water demand or supply and so should be neutral relative to implementation of TROA.

e. Washoe County, Nevada

Washoe County is developing and implementing the *Washoe County Comprehensive Regional Water Management Plan* (Washoe County, 2004). Washoe County reports that:

Nevada Law, Nevada Revised Statutes (NRS) 540A.150.2 requires that the Washoe County Comprehensive Regional Water Management Plan be consistent with and carry out or support the carrying out of all aspects of P.L. 101-618, 104 Statute 3324. The adopted plan as amended complies with this provision in the law. The plan and the current update (in progress) assume that TROA will be implemented. The adopted plan includes a definition for TROA in the glossary, a description in the constraints section and specific discussion in several other places, including sections on water resources, effluent reuse, instream flows, conservation, drought storage and drought yield (CE#: PW-TN-7).

Potential Impacts: Because provisions of TROA that relate to local water management would be recognized in the regional plan, local planning and operations under TROA would likely be coordinated to avoid impacts.

f. South Truckee Meadows Water Treatment Plant

Washoe County proposes to construct a water treatment plant with a build-out capacity of 12 million gallons per day to treat poor quality water diverted from Galena, Whites,

Steamboat, and Thomas Creeks. The South Truckee Meadows Plan is intended to back up the use of creek water rights with existing rights to groundwater, and is not a conservation plan. Water will be pumped from poor-quality areas and treated in the water treatment facility built to treat the creek rights. The effluent from the South Truckee Meadows wastewater plant is not returned to the river and does not have to be made up because the county will only divert the consumptive use fraction of the creek rights (CE#: WS-TN-1).

Potential Impacts: TROA would have no direct effect on construction of water systems. While the method, location, quality, and quantity of discharge of treated wastewater could affect water management options under TROA to achieve flow and water quality objectives in the Truckee River, this plan not increase discharge to the Truckee River or affect water management decisions under TROA relative to water quality in the river.

g. North Valleys Water Importation Project

Two independent water supply companies have applied for rights-of-way across public lands for a pipeline, wells, and other infrastructure in order to import 11,500 acre-feet of water from a basin adjacent to the Truckee River basin for M&I use (CE#: WS-TN-3).

BLM issued a ROD granting rights-of-way for the Fish Springs Ranch, LLC, and the Intermountain Water Supply Ltd. projects on May 31, 2006 and June 23, 2006, respectively. The Pyramid Tribe subsequently filed a lawsuit challenging BLM's ROD under NEPA. The Pyramid Tribe and Fish Springs Ranch, LLC, have reached a proposed agreement to resolve various environmental issues and claims by the Pyramid Tribe relative to the project proposed by Fish Springs Ranch, LLC; that agreement is now under review by the United States. An agreement with Intermountain Water Supply is anticipated that will limit delivery of the supplied water to basins that do not drain to the Truckee River basin.

Potential Impacts: Absent agreements addressing project operations, although this water is proposed for use outside the Truckee River basin, groundwater withdrawal in adjacent basins could slightly reduce local inflow to Pyramid Lake, and discharge of additional treated wastewater to the Truckee River could incrementally diminish water quality in the lower Truckee River and have a detrimental effect on Pyramid Lake, both to an unknown degree. To the extent such impacts are realized, they could reduce the efficacy of TROA in providing benefits to biological resources in the lower Truckee River and Pyramid Lake. With agreements among the parties, to the extent that the effects of groundwater pumping and treated wastewater discharge do not affect the Truckee River basin, this action is not expected to affect implementation of, or the benefits to be derived from, TROA. TROA would not affect implementation of this project.

h. Aqua Trac

Aqua Trac, LLC has filed permits with Reclamation and BLM for the purpose of developing water source wells and a water transportation system to provide potable water

to Fernley and the surrounding area. The project proposes to construct up to nine new water source wells in the Granite Springs Valley in Pershing County; 28 miles of 48-inch pipeline with appurtenances, from the Granite Springs area, northwest of Jessup and the Humboldt Sink to Fernley; and an electric substation with 60-kilovolt electric service lines.

Potential Impacts: Inter-basin transfer of water to a water-limited area would accommodate and promote urban development. Such development would likely cause non-point source pollution through surface runoff and point source pollution through discharge of treated wastewater, which could affect surface and groundwater water quality and quantity. Treated effluent could increase flow in receiving waters through direct discharge and could increase groundwater supply through seepage. To the extent that this project would reduce demand on the Truckee River, water savings would provide additional opportunities to create and store Credit Water that would be managed under TROA with its associated potential benefits. Benefits would accrue to owners of the Credit Water as well as to aquatic and riparian resources downstream from Credit Water storage facilities.

2. Groundwater Development Actions for M&I Demands

As water demands increase, groundwater becomes a more likely additional water source. Some areas depend entirely on groundwater, while many areas use groundwater as a supplemental water source in dry years. The Nevada State Engineer restricts the amount of groundwater use to the natural yield of the groundwater basin.

a. Squaw Valley, California

Squaw Valley, California, Public Service District water demand is projected to be 1,600 gallons per minute. The district has constructed two wells that will provide an annual production of 1,640 acre-feet sustained yield (CE#: WS-TC-2).

Potential Impacts: TROA would have no effect on this action. To the extent this project would reduce the discharge of Squaw Creek, it could affect the opportunity to store and manage Credit Water under TROA and reduce identified benefits. If well production is within the limits of sustainable yield, it should have no effect on creek flow.

b. Maximizing South Truckee Meadows Well Field

South Truckee Meadows well field pumping capacity could be increased to 9,500 acre-feet per year for M&I water. Average pumping would be 6,900 acre-feet per year; the maximum amount would be used during droughts (CE#: WS-TN-2).

Potential Impacts: To the extent this action would reduce tributary discharge to the Truckee River, it could affect the opportunity store and manage Credit Water under TROA and reduce identified benefits. TROA would have no direct effect on local water development.

c. Well Field Near Wadsworth, Nevada

A municipal water supply well field and system would be constructed near Wadsworth to serve non-Tribal and Tribal areas in the Fernley and Wadsworth areas (CE#: WS-TN-6).

Potential Impacts: This action may potentially substitute groundwater use for some surface water use. Depending on location of wells, quantity of water pumped, and surface water exchange provisions, groundwater withdrawals could reduce surface water flows in the Truckee River, and so could reduce opportunities to store and manage Credit Water under TROA. Development of additional water supplies could promote local urban development, which could affect water quality in the lower Truckee River through point and non-point discharges. To the extent that water quality is diminished as a result of urban development, opportunities for water management under TROA could become more limited. TROA would have no direct effect on local water development.

d. Carson River upstream of Lahontan Reservoir

Rapid and extensive urban development in the Carson River basin, particularly in Dayton Valley and Carson Valley, has created an increasing demand for M&I water. To meet that demand, water purveyors have filed a large number of applications with the Nevada State Engineer to transfer groundwater and *Alpine* decree surface water rights in the vicinity of the Carson River. Protests have been filed by the Pyramid Tribe and Churchill County.

Potential Impacts: To the extent that such applications are approved, junior rights are exercised, and annual or seasonal Carson River discharge to Lahontan Reservoir is diminished, this set of actions could reduce water availability for downstream water right owners, particularly those dependent on the Newlands Project supply, and could increase Newlands Project demand on the Truckee River in order to meet Lahontan Reservoir storage targets pursuant to OCAP. Any resulting reduction in lower Truckee River flow could reduce opportunities to store and manage Credit Waters dedicated to benefit Pyramid Lake fishes and other biological resources in and along the Truckee River.

D. Ecosystem Restoration

Human activities have degraded riparian, wetland, and lake and river habitats in the study area. Past development often did not consider ecosystem impacts. Site-specific projects to improve some of these degraded areas have been implemented and proposed; these projects likely will continue. The operations model did not incorporate assumptions about ecosystem restoration projects or diversion structure improvements.

1. Tahoe Regional Planning Agency

The Tahoe Regional Planning Agency (TRPA) is implementing the Lake Tahoe Environmental Improvement Program for erosion control, wetlands restoration, forest

health projects, and similar efforts needed to control algae growth and other factors believed to cause the deterioration of overall water quality of the lake (CE#: WP-LT-2). Also, see “Water Quality Trends” in this chapter.

Potential Impacts: Projects would result in protection of several Tahoe yellow cress sites and would restore wetland, riparian, and lake habitats. TROA would not affect implementation of any projects in watersheds tributary to Lake Tahoe.

2. Restoring Stream Banks and Riparian and Wetland Habitats

The following site-specific restoration projects have been identified:

- The Nature Conservancy is restoring river channels and wetlands on purchased lands, such as the McCarran Ranch (CE#: HR-TN-1).
- Washoe-Storey Conservation District’s Steamboat Creek Restoration Plan proposes to restore up to 2.2 miles of Steamboat Creek (CE#: HR-TN-8).
- Recreation areas managed by California Department of Parks and Recreation (such as Tahoe State Recreation Area) are restoring native vegetation, removing non-native plants, and implementing Best Management Practices (BMP) to control erosion (CE#: HR-LT-5).
- The Pyramid Tribe and FWS are cooperating on a program to reestablish cottonwoods and the riparian canopy along the lower Truckee River.

Potential Impacts: Project goals include enhanced water quality, habitat improvements, flood attenuation, and increased recreation opportunities, which could improve water quality, riparian habitat, and other habitat. TROA could enhance the benefits of riparian and riverine improvement projects through the creation and management of dedicated Credit Waters and coordination of reservoir releases. TROA provides for a habitat restoration fund but does not specify projects. Depending on the amount of revenues deposited in the fund, implementation of TROA could accelerate restoration activities associated with cui-ui, LCT, and Lahontan Valley wetlands.

3. Improving Diversion Structures

Improvements to water diversion facilities and structures to facilitate fish passage and improve water diversion efficiency are proposed.

a. Truckee Meadows Water Authority

Truckee Meadows Water Authority (TMWA) proposes to replace the Glendale Diversion structure and riprap. The existing structure in Truckee Meadows diverts up to 25 million gallons per day. The new structure will divert up to 37.5 million gallons per day, which is the existing plant capacity (CE#: GS-TN-6). TMWA submitted a permit application to COE for this project in September 2006.

Potential Impacts: The structure will incorporate a water bypass to benefit fish habitat in the Truckee River between the diversion and Pyramid Lake. This action may potentially enhance recreation opportunities and promote sediment transport. TROA could enhance the benefits of bypass improvement projects through the creation and management of dedicated Credit Waters and coordination of reservoir releases.

b. Sierra Pacific Power Company

Sierra Pacific Power Company (Sierra Pacific) is obligated to replace Farad Diversion Dam (which washed out in 1997) for TMWA. The project includes a fish passage structure at Floriston and access roads (CE#: IP-TC-1).

Potential Impacts: The new dam will divert water into the hydroelectric powerplant more efficiently. This project may improve recreational opportunities for rafting and kayaking. Improved fish passage would be mitigation for construction of the new diversion. TROA could enhance the benefits of bypass improvement projects through the creation and management of dedicated Credit Waters and coordination of reservoir releases.

c. Derby Diversion Dam

Reclamation completed construction of a fish passage facility at Derby Diversion Dam and will add a fish screen, expected to be completed in 2007. The fish screen project is in abeyance until funding is secured (CE#: HR-TN-9).

Potential Impacts: Passage benefits resident and migratory fish, assists in recovery of cui-ui and LCT, and provides cultural and economic benefits to the Pyramid Tribe. TROA could enhance the benefits of bypass improvement projects through the creation and management of dedicated Credit Waters and coordination of reservoir releases.

4. Wildfire/Fuels Management

Most of the forested land along the Truckee River west of Reno is U.S. Forest Service (USFS) land. The Truckee River and its tributaries flow through three national forests: Lake Tahoe Basin Management Unit; Tahoe National Forest; and Humboldt-Toiyabe National Forest. Fire/fuels management on adjacent land is outside the scope of the proposed action, which relates to reservoir management.

Wildfires can cause erosion that affects water quality; effects can be significant if the wildfire covers a large area, and increases with the steepness of the ground. In addition, runoff and subsequent storage in lakes and reservoirs would likely increase after a wildfire due to surface sheet flow and subsurface flow increases because vegetation is no longer present to hold or transpire water. Such increases in runoff and storage could affect flood control operations.

Management of forested areas for all three national forests is regulated by the *Sierra Nevada Forest Plan Amendment; Final Supplemental Environmental Impact Statement ROD*, U.S. Department of Agriculture, USFS, January 2004. It addresses existing fire risk, healthy forest fuels management plan, and catastrophic fires.

There are numerous management strategies in the 2004 Plan Amendment for the various areas and conditions in the Sierra Nevada. The Fire and Fuels Management Strategy “applies a strategic approach for locating fuels treatments across broad landscapes.” The fuels treatment strategies in the Plan Amendment are designed to reintroduce fire, reduce fuel levels, and mitigate the consequences of large damaging wildfires, as well as allow fire managers to control fires and set priorities that protect firefighters, the public, property, and natural resources. The landscape-level fuels treatment strategies are designed to limit wildland fire extent, modify fire behavior, and improve ecosystems.

Proposed fuels treatment activities are planned to be accomplished over the next 20-25 years. Resource effects, including effects to water quality and quantity, of USFS planned management strategies are described in the Sierra Nevada Framework.

Fire risk on forested land also may be affected by private landowners along the upper Truckee River and its tributaries. Private land ownership is small compared to Federal land ownership of forested lands, and potential effects from wildfire are much less. There is no coordinated “land management” plan that directs fuels management of forest stands on private lands; information about fire/fuels management on private land is available from California Department of Forestry.

Forested lands along the Truckee River downstream from Truckee Meadows occur as small amounts of scattered cottonwood stands immediately adjacent to the river with minimal fire risk. The majority of the land is scrub sagebrush. Land ownership is mostly private, with checkerboard BLM ownership on the north side of the river, some Reclamation lands around Derby Diversion Dam, and the Pyramid Lake Indian Reservation on a portion of the lower Truckee River. Private lands do not have coordinated fire management plans; BLM land management practices would not be expected to alter or affect fire risk along this section of the Truckee River. Reservation land management practices are not expected to affect fire risk.

Potential Impacts: TROA cumulatively combined with other management activities in the Truckee River basin would have no effects on fuels management practices on Federal lands. There would also be no cumulative effects on the number or severity of wildfires or on firefighting activities in the watershed. Ongoing fuels management practices on USFS land, including forest thinning and reduction of fuel loadings, would reduce potential cumulative impacts of large wildfires that remove vegetation resulting in increased surface sheet flows and subsurface flows into the rivers and reservoirs. While water quality degradation from wildfires would combine with other management activities in the watershed that degrade water quality, the cumulative impact is unknown due to the inability to predict number and size of wildfires that might occur in the future.

E. Flood Control

Current flood control criteria are an integral part of current conditions and all alternatives. The following flood control measures are identified:

- COE is considering flood control and restoration projects under the Truckee River Management Project (previously the Truckee Meadows Flood Control Project CE#: PW-TN-5).
- COE currently is conducting a multi-year study to consider several possibilities for the Martis Creek Reservoir, ranging from complete rebuilding to removing the dam.
- Washoe County is considering constructing flood control facilities on tributaries (CE#: PW-TN-6).
- The 6,700 acre-feet of water rights mentioned as part of a separate agreement in section 1.E.4 of TROA can be used, pursuant to section 113 of P.L. 109-103, Energy and Water Development Act of 2006, for local match to support expenditures required for the Truckee Meadows Flood Project, including re-vegetation, and reestablishment and maintenance of riverine and riparian habitat of the lower Truckee River and Pyramid Lake.

Potential Impacts: TROA would not affect any flood control criteria or operations. No construction is associated with TROA. Habitat maintenance and protection accomplished through flood control projects could allow greater flexibility in the management and release of Credit Waters established pursuant to TROA.

F. Water Quality

In the early 20th century, the mining and timber industries caused Truckee River water quality to decline drastically and become a serious human health and environmental problem. Over the years, many water quality problems have been identified and corrected. A variety of Federal and State water quality standards have been developed, and entities are acting to meet those standards. The Pyramid Tribe recently approved water quality standards for the lower Truckee River and Pyramid Lake. Projects and programs are being implemented to improve water quality. As development continues, additional and advanced measures will be needed. The operations model calculates flow and does not make any assumptions regarding water quality; stormwater is modeled as part of runoff to the river, and the Truckee River Water Quality Settlement Agreement (WQSA) is implemented relative to water storage and release. The WARMF model assumes changes in point source loading from the Tahoe-Truckee Sanitation Agency water reclamation facility (TTSA) and TMWRF, and that treated wastewater discharge will be proportionate to the future population (year 2033); it incorporates conditions of the Total Maximum Daily Load (TMDL) program.

1. Wastewater and Stormwater Discharge Permits

California and Nevada have wastewater discharge permit programs in place. Section 404 of the Clean Water Act establishes a program to regulate the discharge of dredged and fill material into waters of the United States, including wetlands. EPA and COE jointly administer the program. Stormwater discharge permits are a developing trend. Effects on water quality will depend on compliance with and enforcement of regulations.

a. Lahontan Regional Water Quality Control Board

The Lahontan Regional Water Quality Control Board (LRWQCB) has more than 270 permit applications active in the Lake Tahoe basin and 49 active in the Truckee River basin in California. Most of these are stormwater, and most are related to temporary construction permits. LRWQCB requires applicants to comply with water quality standards. Monitoring is not required for all projects, but it is required for ski areas (CE#: WQ-TC-1 and WQ-LT-1).

Potential Impacts: Unless effects of wastewater discharge are totally mitigated, some adverse effects to water quality from these and future projects may occur. TROA operations could enhance seasonal water quality through management of dedicated Credit Water releases.

b. Nevada Division of Environmental Protection

Nevada Division of Environmental Protection (NDEP) has more than 15 wastewater or stormwater permit applications identified in Truckee Meadows (CE#: WP-TN-1).

Potential Impacts: Unless the effects of wastewater discharge are totally mitigated, some adverse effects to water quality from these and future projects may occur. TROA operations could enhance seasonal water quality through management of dedicated Credit Water releases.

c. SWRCB

SWRCB issued a National Pollutant Discharge Elimination System (NPDES) permit to Caltrans for its construction program. The permit regulates discharges from projects with soil disturbance of 1 acre or more. Caltrans requires contractors to prepare and implement Water Pollution Control Plans for projects causing soil disturbance of less than 1 acre (CE#: PW-LT-3).

Potential Impacts: Effects would depend on how BMPs and mitigation are implemented. TROA would not affect implementation of this program.

d. Nevada Department of Transportation

Nevada Department of Transportation has been issued a blanket NPDES permit (NV-0023329) from the Nevada Division of Environmental Protection for discharges to municipal separate storm sewer systems in the Truckee River basin in Nevada (CE#: WP-LT-4).

Potential Impacts: BMP may potentially improve the quality of stormwater drainage. TROA would not affect implementation of this program.

e. Stormwater Control Programs in Nevada

The cities of Reno and Sparks, Washoe County, and the Nevada Department of Transportation adopted the Truckee Meadows Stormwater Quality Management Program in December 2001 to control stormwater quality and comply with the Phase 1 NPDES permit. The program addresses point source pollution from stormwater.

Washoe County is implementing stormwater pollution controls Phase II, including construction and post-construction BMP, industrial permitting and inspections, monitoring for illegal discharge, and prevention. This program addresses nonpoint source pollution from stormwater (CE#: WQ-TN-1).

Potential Impacts: Stormwater management is anticipated to reduce urban stormwater pollutants to the Truckee River and tributaries in Truckee Meadows. TROA would not affect implementation of this program.

f. Water Treatment Plants

The following water treatment plant actions have been proposed:

- Washoe County proposes to construct a potable water treatment plant to treat water from Galena, Whites, Steamboat, and Thomas Creeks. The total peak capacity at build-out would be 12 million gallons per day. Maximum withdrawal in any given year would be 7,600 acre-feet. This project would treat groundwater that does not currently meet drinking water standards (CE#: WQ-TN-5).
- TMWRF is expanding its treatment capacity to 51.2 million gallons per day to meet planned treatment demand for the region (CE#: WW-TN-1).
- The Pyramid Tribe is planning to develop a consolidated wastewater system for Nixon (CE#: WW-TN-6).
- Washoe County and the Pyramid Tribe propose to construct a wastewater treatment plant and sewer collection system to serve both private and Tribal areas of Wadsworth, Nevada (CE#: WW-TN-3).

Potential Impacts: These activities may potentially improve river water quality. TROA operations could enhance seasonal water quality through management of dedicated Credit Water releases.

g. Washoe County Sewer Interceptor

Washoe County and Reno are constructing a sewer interceptor to provide service to the Verdi/Lawton area to transport wastewater to TMWRF for treatment (CE#: WW-TN-2).

Potential Impacts: The interceptor would remove septic system discharge to groundwater that eventually reaches the Truckee River and transport this wastewater to existing facilities for treatment. This project could change the timing of flows, which may potentially improve water quality and quantity and reduce nitrogen loading to the Truckee River. TROA operations could enhance seasonal water quality through management of dedicated Credit Water releases.

h. South Truckee Meadows Water Reclamation Facility

South Truckee Meadows Water Reclamation Facility project proposes expanding the facility to treat up to 11,000 acre-feet of wastewater per year (CE#: WS-TN-1).

Potential Impacts: This facility does not discharge to the Truckee River. All effluent would be reused for irrigation and industrial purposes. TROA would have no effect on this action.

2. Other Water Quality Improvement Projects

With most point sources having been identified and being addressed under existing programs, future programs are likely to emphasize nonpoint source pollution (e.g., stormwater) control.

a. TRPA

TRPA is implementing the Environmental Improvement Program for erosion control, wetlands restoration, forest health projects, and similar efforts to control algae growth and other factors believed to cause the deterioration of water clarity and overall water quality of Lake Tahoe (CE#: WP-LT-2).

Potential Impacts: These projects could improve quality of water draining to Lake Tahoe. TROA would not affect the implementation of projects in watersheds tributary to Lake Tahoe.

b. LRWQB

LRWQB identified actions to improve water quality at Squaw Valley. Squaw Valley Ski Corporation will undertake these actions through the year 2011 (CE#: WP-TC-2).

Potential Impacts: These actions could reduce erosion and sediment discharge to Squaw Creek. TROA would not affect the implementation of projects on tributaries to the Truckee River.

c. Idlewild Park, Nevada

Reno proposes to make improvements to the Idlewild Park pond by dredging a channel through the lower pond to improve habitat for fish and installing an aerator for water circulation. The pond drains to the Truckee River (CE#: HR-TN-10).

Potential Impacts: These actions may improve water quality and fish habitat in the pond, but may potentially create a point source for nutrient loading to the Truckee River. TROA would have no direct effect on this action.

d. Ski Resort Runoff Control

Alpine Meadows (CE#: WP-TC-1), Sherwood Cliffs (CE#: SR-LT-2), and Squaw Valley (CE#: WP-TC-2) are retrofitting parking lots for erosion control and stormwater runoff.

Potential Impacts: By controlling erosion and stormwater runoff, these and similar projects may potentially improve water quality in tributaries to the Truckee River. TROA would have no direct effect on this action.

e. Golf Course Relocation

Reclamation and Tahoe Regional Planning Agency are preparing an EIS/EIR for the Upper Truckee River Restoration and Golf Course Relocation Project in El Dorado County. The Golf Course Relocation Project is a restoration project along the reach of the Upper Truckee River that extends from its entry point at the southern boundary of Washoe Meadows State Park to that point just west of U.S. Highway 50 where the river exits Lake Valley State Recreation Area. The property involved includes the Lake Tahoe Golf Course.

The Golf Course Relocation Project is intended to restore, to the extent feasible, ecosystem functioning in terms of ecological processes and aquatic and riparian habitat quality and to reduce erosion and improve water quality, including reduction of the reach's contribution of suspended sediment and nutrient loading in the Upper Truckee River and Lake Tahoe. It is intended to maintain golf recreation opportunity and quality of play at a championship level.

Potential Impacts: This relocation project is intended to improve water quality in the Lake Tahoe basin, but is not expected to affect the water supply in Lake Tahoe subject to management under TROA.

3. TMDL Program

Section 303(d) of the Federal Clean Water Act requires States to undertake specific activities to protect the quality of their rivers, streams, lakes, and estuaries, and to develop and update a list of water bodies that do not meet water quality standards. Section 305(b) requires States to conduct biennial assessments of the Nation's water resources to identify and list those waters that are not achieving water quality standards. The resulting list is referred to as the 303(d) list. The list provides the States a way to identify problems and develop and implement pollution control plans to protect beneficial uses and attain applicable water quality goals. Section 303(d) requires the development of a pollution control plan called a "Total Maximum Daily Load" or TMDL for each identified water body and associated pollutant.

TMDL specifies the maximum amount of a pollutant that a water body can receive and still meet water quality standards. It allocates pollutant loadings to point and non-point sources such that standards will be met. Point sources include discharges from wastewater treatment plants, industrial facilities, and some stormwater collection systems. Nonpoint sources include runoff from farms, rangelands, timberlands, and urban areas.

For stream segments and water bodies that are not 303(d)-listed, Federal antidegradation regulations provide that, where degradation of water quality is permitted in exchange for socioeconomic benefits, beneficial uses must still be fully protected. An EPA document (EPA A841-F-94-006, August 2004) that summarizes Truckee River TMDLs for total nitrogen, total phosphorus, and total dissolved solids can be viewed at <http://www.epa.gov/OWOW/tmdl/cs13/cs13.htm>.

In California, LRWQCB has local responsibility for developing standards that protect the beneficial uses of water bodies and rivers. Its current 303(d) list can be viewed at <http://www.swrcb.ca.gov/tmdl/docs/2002reg6303dlist.pdf>. LRWQCB identified water quality problems and potential sources of pollutants for the Truckee River and Lake Tahoe hydrologic units. It is in the process of developing a TMDL to assess the water quality problems and sources of pollutant discharges, and to identify pollutant load reductions needed to attain water quality protection goals.

In Nevada, the Truckee River is 303(d)-listed for total phosphorus, total nitrogen, total dissolved solids, and turbidity; NDEP incorporated those TMDLs in the NPDES permit for TMWRF in 1994. As a result of noncompliance with the permit limit for total nitrogen, NDEP issued a Finding of Alleged Violation and Order to TMWRF on November 14, 1997. Nevada's current 303(d) list can be viewed at <http://ndep.nv.gov/bwqp/303list.pdf>. This list shows temperature, total phosphorus, and turbidity for various reaches of the Truckee River in Nevada.

Potential Impacts: The increasing population and urban development trend in the Lake Tahoe and Truckee River basin results in more point source and nonpoint source loadings to the Truckee River. As population increases, wastewater treatment plants upgrade to accommodate more wastewater, as required under the NPDES permitting process.

Nonpoint source loadings tend to increase due to more nonpermeable surfaces, such as asphalt parking lots, which contain, for example, fluids leaked from automobiles, which are flushed directly into water bodies during storm events. BMPs for nonpoint sources tend to be more cost-effective than additional point source reductions. Therefore, some pollution reduction trading among stakeholders is typically proposed to reduce costs. Stormwater BMPs tend to be cost effective and desirable as they reduce the “first flush effect” of nutrients and organics from the watershed and may help prevent flooding as well. Many streams in the Lake Tahoe and Truckee River basins are section 303(d)-listed for sedimentation and siltation. Current TRPA regulations have reduced the problems associated with shoreline protection facilities at Lake Tahoe. Stream restoration plans on Snow Creek, Trout Creek, and the Truckee River should reduce sedimentation and erosion in the future. TROA operations could enhance seasonal water quality through management of dedicated Credit Water releases.

4. WQSA

The Truckee River Water Quality Settlement Agreement, signed in October 1996, provided for the acquisition of Truckee River water rights and augmentation of the flow of the Truckee River to improve water quality and habitat conditions, increase nutrient assimilative capacity of the Truckee River, and reduce nonpoint source pollutant loading. WQSA calls for acquisition of \$24 million of Truckee River water rights, with the Federal government and the local governments each responsible for the expenditure of \$12 million. The local governments have initiated their acquisition program and have already purchased more than 2,800 acre-feet of water rights. The analysis completed for the combined case in the WQSA draft EIS assumes 12,600 acre-feet of Truckee River water rights are acquired from Truckee Division, 1,500 acre-feet from the Truckee River corridor, and 2,900 acre-feet from Truckee Meadows. As of October 31, 2006, 4,537.54 acre-feet of Truckee Division water rights had been purchased pursuant to WQSA. The water associated with water rights acquired would be stored in Truckee River reservoirs when possible and generally released during periods of low flow (June-September) to improve water quality in the lower Truckee River. This action was analyzed in an EIS (BIA, 2002), with a ROD completed in December 2002 (CE#: WQ-TN-6).

Potential Impacts: Opportunity to store water associated with water rights acquired pursuant to WQSA is currently limited by reservoir operations and so, although such water may flow to Pyramid Lake, there is little opportunity to manage it to achieve the maximum benefits identified in WQSA. Implementation of TROA would allow a greater opportunity to store WQSA water (as Water Quality Credit Water) and manage its release to achieve the maximum benefits identified in WQSA as well as other riverine and riparian benefits that would be promoted by ensuring streamflow along the entire course of the Truckee River.

G. Global Climate Change

Recent research on global climate change indicates that the climate of the western United States may gradually become warmer as the century progresses (Lettenmaier and Gan, 1990; Snyder et al., 2002). Temperature increases could cause less snow and more rain during winter, reducing snowpack that feeds streams during warm months. In addition, the frequency of hot summer days could increase, thus increasing water demands. Climate change models, however, do not indicate a measurable climate change for the northern Sierra Nevada (including the Lake Tahoe and Truckee River basins) until well after the end of the period of analysis. Snowpack and streamflows are expected to remain relatively unchanged up to the year 2033. The specific effects of global climate change on water resource management in the future are uncertain. Climate change could result in altered snowpack accumulation and melting, runoff patterns, water supply, sea level, floods and droughts, water demands, water temperature, plant and animal life including livestock, hydroelectric power generation, wildfires, recreation, water quality, soil moisture, groundwater, and ecosystems.

There is currently a gap in the understanding of the specific effects associated with global climate change on local water systems. Changes in the timing and distribution of precipitation and runoff can create greater uncertainty, potentially requiring changes to the management of the water system. There is a need for improved runoff prediction and other scientific information to support water management decisions.

Water managers will continue to evaluate climate change and study ways of incorporating flexibility into the system to respond to climate change. By enhancing coordination and improving reservoir operation efficiencies, TROA would provide opportunities to address potential climate change impacts (CE#: GC-1).

VI. Cumulative Effects on Affected Resources

In this section, the action categories described and evaluated in section V are evaluated in the context of the effects of TROA on individual resources (summarized from chapter 3). A narrative summary presents the potential cumulative effects of TROA on each affected resource. Discussions for LWSA and TROA are not presented in instances where the cumulative effect is the same as that described for No Action; discussions for LWSA or TROA are only presented where the cumulative effect differs from No Action.

A. Surface Water

As presented in chapter 3, operations under TROA generally would increase the amount of water in storage in Truckee River reservoirs through the establishment of Credit Water; Credit Water establishment generally would reduce Truckee River flows during the higher runoff months for release during the lower flow months, although Credit Water could be released when requested consistent with the provisions of TROA. TROA would not create new water resources or water rights.

1. Comparison of Alternatives by Action Category

The following section summarizes the potential cumulative effects of TROA and the other alternatives on water resources according to action category. The qualitative analysis is based on the analysis of indicators and effects discussed in chapter 3.

a. Urban Development and Land Use

No Action: The current planned rate and pattern of urban and land development is expected to continue until the water demands and population levels associated with the year 2033 are achieved. Demographic or planning changes could alter the current water use rate; such changes would either hasten or delay the time of achievement of those demand levels. Expansion of nonpermeable surfaces would reduce groundwater recharge potential in and increase stormwater runoff from developing urban areas.

b. Water Rights Acquisitions and Transfers

No Action:

- Because the interstate allocation of Lake Tahoe and upper Truckee River basin water as provided in P.L. 101-618 would not be effective, there would be no codified maximum diversions under all water rights in the basins for California or Nevada, which could lead to priority conflicts between water users in the two States. If California water consumption increased above the P.L. 101-618 limits effective with TROA, commensurate increases in water shortages could occur in Nevada, which would be felt most keenly by the lower Truckee River, Pyramid Lake, Newlands Project, and Lahontan Valley wetlands, which tend to have more junior water rights than Truckee Meadows; drought conditions in Truckee Meadows also could be exacerbated.
- Existing *Orr Ditch* decree agricultural water rights would continue to be acquired and transferred to urban areas for M&I use.
- Applications for transfer of *Alpine* decree groundwater and surface water rights would seek to develop local water supplies to satisfy the increasing M&I demand related to urban expansion. Downstream effects would depend on amount and priority of rights transferred; any decrease in Carson River discharge to Lahontan Reservoir could increase diversion of Truckee River water to the Newlands Project.

LWSA: Same as under No Action.

TROA:

- The interstate allocation would be in place, thereby codifying the maximum diversions under all water rights in the basins for California and Nevada.

- Disposition of *Orr Ditch* decree water rights would be similar to that under No Action. Adverse downstream effects from exceeding the limits, as described under No Action, would be avoided.
- Disposition of *Alpine* decree water rights would be similar to that under No Action. Increased diversions from the Truckee River to the Newlands Project could reduce opportunities to store and manage Credit Waters.

c. M&I Water

No Action: Demographic or planning changes could alter the current water use rate; such changes would either hasten or delay the time of achievement of M&I demand associated with the year 2033. Surface water and groundwater supplies would continue to be used to varying degrees, depending on developing water use trends; the combination of measures would be the cumulative but unknown effect. Development rates may be higher or lower, and, thus, demands may be achieved earlier or later than 2033. Once M&I demands for the various population centers exceed the projected year 2033 levels, additional water supplies (e.g., pumping and recharging local aquifers, importing surface and groundwater, converting agricultural water rights to M&I use, pumping Sparks Marina Lake, and/or increased water conservation) would be required.

TROA: Demographic and planning variables related to M&I demand would be the same as under No Action. Measures to supply M&I water up to the year 2033 demand levels would be implemented as specified in TROA. Additional water supplies to satisfy M&I demands or increased water conservation once demands exceed the projected year 2033 levels would be required and developed from available sources.

d. Ecosystem Restoration

No Action: Ecosystem restoration projects could change the morphology of the river channel, providing deeper pools and narrower channels than currently exist, which would reduce evaporation. Restoration of riparian vegetation may increase consumptive use of river water; this could be offset in part by cooler temperatures associated with additional shading.

TROA: TROA would include a provision for funding a habitat restoration fund to plan and implement fish habitat restoration or maintenance projects in the Truckee River basin proposed by California, Nevada, and the Pyramid Tribe. Such funds could be leveraged with other funding, donations, or grants to supplement or expand other proposed.

e. Flood Control

No Action: Continuation of existing flood control criteria would not affect water resources in the Truckee River basin; implementation of planned or potential flood control measures could have an effect but to an unknown degree.

f. Water Quality

No Action: Waste and stormwater discharge permits would not affect water supply. Any potential land application for treated wastewater would require purchasing water rights to offset the surface water portion of potential loss.

g. Climate

No Action: No cumulative effects from climate change are identified for the period of analysis.

2. Potential Cumulative Effects of TROA

The availability of water resources in the study area is determined to a great degree by the vagaries of weather. TROA would have no significant cumulative effect on the total quantity of water resources in the study area because no new water rights or water resources would be created, and procedures for the exercise of existing water rights (and for storage and release of related Credit Waters) using available water resources (storage and unregulated flow) would be specified in TROA. The general pattern for the exercise of water rights to create Credit Waters would reflect the runoff pattern and likely be the same under any future scenario, although the amount for the various categories could vary depending on the amount of annual runoff and priority of the respective water rights. Exchange and release of the various Credit Waters would be flexible and be determined in large part by intended benefits to be achieved for the respective Credit Waters.

B. Groundwater

Article 10 of TROA would include criteria for wells drilled in the Truckee River basin in California to minimize short-term reductions of surface streamflows. As presented in chapter 3, because TROA would affect only the timing of Truckee River reservoir releases but not the quantity, it would only have minor effects (either beneficial or adverse) on groundwater recharge in the study area.

1. Comparison of Alternatives by Action Category

The following section summarizes the cumulative effects of TROA and the other alternatives on groundwater according to action category. The qualitative analysis is based on the analysis of indicators and effects discussed in chapter 3.

a. Urban Development and Land Use

No Action: Urban development in former agricultural areas could decrease infiltration of surface water into the aquifer, depending on the extent of non-permeable surfaces (e.g., paving) and lawn watering. Reduced flow in or closure of canals could also reduce recharge potential.

b. Water Rights Acquisitions and Transfers

No Action: Absent interstate rules or supply limitations governing the issuance of water rights by California and Nevada, additional use of Lake Tahoe and upper Truckee River basin water could reduce Truckee River supply currently available for diversion to canals; this could reduce seepage losses that contribute to groundwater recharge.

TROA: The interstate allocation would codify the maximum upper basin diversions and would be as analyzed in chapter 3.

c. M&I Water

No Action: Use of groundwater beyond that assumed for the future could lower local water tables. Streams with nearby wells that are in the shallow alluvial aquifers could have greater stream seepage loss.

LWSA: Similar to No Action with slightly more groundwater use in dry years and with additional aquifer recharge component.

d. Ecosystem Restoration

No Action: Restoration of deep-rooted riparian vegetation may increase consumptive use of groundwater; this could be offset in part by cooler temperatures and reduced evaporation associated with additional shading.

e. Flood Control

No Action: Flood attenuation projects could enhance opportunities for groundwater recharge by increasing infiltration.

f. Water Quality

No Action: Replacing septic systems with wastewater treatment could slightly decrease groundwater infiltration and slightly improve groundwater quality. Land application of treated wastewater could promote groundwater recharge.

g. Climate

No Action: No cumulative effects from climate change are identified for the period of analysis.

2. Potential Cumulative Effects of TROA

TROA would not implement or affect any current or proposed groundwater development or management plan; it would, however, through implementation of the interstate allocation, and the provisions of Article 10 of TROA, condition groundwater development and codify the maximum upper basin diversions

C. Water Quality

As presented in chapter 3, TROA would have no significant adverse effect on achievement of California water quality standards for the Truckee River from Lake Tahoe to Reno (with specific reference to operations of TTSA) with the major benefit to water quality occurring during dry years. Also, TROA would have no significant effect on achievement of Nevada water quality standards for the Truckee River from Reno to Pyramid Lake (with specific reference to operations of TMWRF) with the major benefit to water quality in dry years.

1. Comparison of Alternatives by Action Category

The following section summarizes the cumulative effects of TROA and the other alternatives on water quality according to action category. The qualitative analysis is based on the analysis of indicators and effects discussed in chapter 3.

a. Urban Development and Land Use

No Action: Point and nonpoint sources of pollution would generally increase as population increases. Effects would depend on location of development and extent of management and treatment of flows.

TROA: Trend of increase in discharges with population increase would continue. Opportunity would exist to manage streamflows to achieve standards more often in dry conditions.

b. Water Rights Acquisitions and Transfers

No Action: Effects on water quality would depend on timing, amount, and location of additional diversions in the upper Truckee River basin.

TROA: The interstate allocation would codify the maximum upper basin diversions.

c. M&I Water

No Action: Wastewater volumes or loadings in excess of the planned capacity of treatment plants would require upgrading or expansion of existing facilities or construction of additional facilities.

TROA: Credit Waters under TROA would allow flexibility to manage streamflows to enhance Truckee River water quality.

d. Ecosystem Restoration

No Action: Restoration projects could reduce local water temperature, increase dissolved oxygen, and reduce nutrients and sediment transport.

TROA: Additional benefits could accrue from use of LVPLFWF and habitat restoration fund.

e. Flood Control

No Action: BMP would attenuate nutrient, organic, and pollutant loading in the Truckee River basin.

f. Water Quality

No Action: Expansion/improvement of wastewater treatment facilities and effective discharge permit system could assist in meeting water quality standards.

TROA: Management of dedicated Credit Water releases could further improve water quality.

g. Climate

No Action: No cumulative effects from climate change are identified for the period of analysis.

2. Potential Cumulative Effects of TROA

Water quality in the Truckee River is largely affected by high runoff events that suspend sediments and associated salts and nutrients—events that would not be influenced by reservoir operations pursuant to TROA—and by point and nonpoint discharges, particularly in median or dry conditions. Water quality is increasingly affected by urban development, such as construction of impermeable surfaces, leakage of fluids from vehicles, and increased storm and wastewater treatment plant discharges. TROA would not affect the amount of storm or wastewater treated by a facility, degree of treatment, or quality of (or water quality parameter loadings by) its discharge. Water quality standards (e.g., TMDL) are established to protect current and planned future uses of water bodies, and are predicated on likely future flow regimes to provide adequate dilution for components of permitted discharges. Such standards are reviewed regularly to respond to changing social values and environmental conditions and to ensure that recognized beneficial uses are protected.

Generally, establishment of Credit Water in Truckee River reservoirs would reduce Truckee River flow associated with Floriston Rates; this would most likely occur from late winter to late spring or early summer. Such a reduction in conjunction with increased wastewater discharges in the California portion of the basin (from TTSA, for example) could cause concentrations of water quality constituents of concern to violate standards in certain months. Credit water releases during the lower flow months (late summer and early fall) would provide a source of dilution water and increase the likelihood that water quality standards would be met at those times; most Credit Water releases would flow to Nevada and a large portion would flow to Pyramid Lake. In addition to providing dilution for TTSA discharges, such water would also dilute the

discharge from TMWRF. TROA would contain provisions to maintain specified minimum flows in the Truckee River downstream from Truckee Meadows and Derby Diversion Dam. In addition, release of Credit Water dedicated for water quality purposes (pursuant to WQSA) in the lower Truckee River could not be diverted (and, thus, it would flow all the way to Pyramid Lake) and so would provide dilution for discharges all the way from the point of release.

Also, there is a potential for Credit Water dedicated for Pyramid Lake fishes to be released consistent with recovery and habitat restoration plans to provide an additional water quality benefit.

Establishment of water quality standards and implementation of water treatment measures would be beyond the purview of TROA. Because of the capacity of TROA for flexible water management and requirements for certain minimum flows for the purpose of water quality, and the opportunities for water rights owners and water managers to coordinate releases of Credit Waters to provide multiple instream benefits, TROA, in conjunction with identified future actions relative to treatment facilities, could affect seasonal flows but would not have a significant effect on water quality in the study area. Water quality would be protected to the extent that TROA operations and dedicated Credit Water allow. Future reviews of water quality standards could identify a need for more or less stringent standards, which could require different water management strategies. The flexibility included in TROA would provide water managers additional opportunities to modify flows to implement those strategies. Development and implementation of advanced water treatment technologies could also improve the quality or reduce the loading from storm and wastewater treatment facilities and further enhance the water management flexibility of TROA.

D. Sedimentation and Erosion

As presented in chapter 3, TROA would have no significant effect on erosion and resulting sedimentation in the study area; reservoir storage and streamflows would occur within the ranges of current operations. Erosion resulting from urban development would not be related to TROA. No manmade induced degradation of any water quality parameters, including erosion and sedimentation, would occur at Lake Tahoe.

1. Comparison of Alternatives by Action Category

The following section summarizes the cumulative effects of TROA and the other alternatives on sedimentation and erosion according to action category. The qualitative analysis is based on the analysis of indicators and effects discussed in chapter 3.

a. Urban Development and Land Use

No Action: There is a potential for increased erosion and resulting sedimentation due to land disturbance and alteration of local stormwater runoff. Effects would depend on location and extent of development as well as efficacy of river restoration projects.

b. Water Rights Acquisitions and Transfers

No Action: Diversion of water to use would not affect dynamics of erosion and sedimentation.

c. M&I Water

No Action: Reduction of agricultural return flows would reduce sedimentation and turbidity.

d. Ecosystem Restoration

No Action: Restoration projects could reduce erosion and sediment transport throughout the basin.

TROA: Additional benefits could accrue from use of LVPLFWF and habitat restoration fund.

e. Flood Control

No Action: COE flood control and restoration projects on the Truckee River could reduce erosion and sedimentation.

f. Water Quality

No Action:

- California and Nevada's plans to implement section 303(d) of the Clean Water Act could reduce sediment and erosion in the Truckee River basin.
- Implementation of waste and stormwater discharge plans for Truckee Meadows would reduce stormwater flows and thereby reduce erosion.

g. Climate

No Action: No cumulative effects from climate change are identified for the period of analysis.

2. Potential Cumulative Effects of TROA

No additional effects relative to erosion and water management were identified and so no significant cumulative effects would be anticipated. Indirect benefits of TROA relative to erosion and sedimentation could accrue as a result of riverine and riparian habitat

improvement projects that could be implemented at a future time using the habitat restoration fund provided for in TROA or using LVPLFWF; the extent of benefits would depend on the types and success of projects selected.

E. Fish

As presented in chapter 3, TROA would have no significant adverse effect on brown or rainbow trout in the study area, and would have beneficial effects relative to preferred flows for those species and would reduce the likelihood of flushing or stranding flows in certain stream reaches. (Pyramid Lake fishes are addressed under “Special Status Species.”)

1. Comparison of Alternatives by Action Category

The following section summarizes the cumulative effects of TROA and the other alternatives on fish according to action category. The qualitative analysis is based on the analysis of indicators and effects discussed in chapter 3.

a. Urban Development and Land Use

No Action: Effects would be related directly to impacts on habitat-related resources such as streamflow, water quality, sedimentation, and riparian canopy, and inversely related to recreation.

b. Water Rights Acquisitions and Transfers

No Action: Effects on fish would depend on timing, amount, and location of additional diversions in the upper basin.

c. M&I Water

No Action: If M&I demands exceed projected amounts, lower streamflows could adversely affect fish populations.

TROA: TROA could enhance seasonal fish habitat through management of dedicated Credit Water releases.

d. Ecosystem Restoration

No Action: Restoration projects could enhance fish habitat throughout the basin, particularly in the Truckee River from Truckee Meadows to Pyramid Lake.

TROA: Additional benefits could accrue from use of LVPLFWF and habitat restoration fund, and from management of dedicated Credit Water releases (e.g., ramping of lower river flows to enhance cottonwood survival).

e. Flood Control

No Action: Flood control could have little effect or could provide substantial benefits downstream from Reno if the emphasis is on ecosystem restoration.

f. Water Quality

No Action: Reduction in loading to streams could enhance habitat conditions.

TROA: TROA operations could enhance seasonal fish habitat through management of dedicated Credit Water releases.

g. Climate

No Action: No cumulative effects from climate change are identified for the period of analysis.

2. Potential Cumulative Effects of TROA

TROA would not adversely affect any current or proposed fishery management plan and would have no adverse cumulative effect on fish or fishery resources in the study area. Direct benefits of TROA to fish populations relate to management of releases of dedicated Credit Waters to provide spawning habitat and to maintain or enhance stream flows for water quality purposes; sustained flow management strategies would also assist in maintaining and enhancing riverine and riparian habitat to benefit fish species as well as other plant and wildlife species. Also, exchanging dedicated Credit Waters among all reservoirs could assist in redistributing water and releases to benefit local fish populations in reservoirs as well as streams. Indirect benefits of TROA relative to fish and fishery resources could accrue as a result of riverine and riparian habitat improvement projects that could be implemented at a future time using the habitat restoration fund provided for in TROA or using LVPLFWF; the extent of benefits would depend on the types and efficacy of projects selected. TROA could also facilitate implementation of revised flow regimes for fish and fishery resources to the extent that Credit Water is available for that purpose.

F. Waterfowl and Shorebirds

As presented in chapter 3, TROA would have no significant adverse effect on waterfowl or shorebirds in the study area.

1. Comparison of Alternatives by Action Category

The following section summarizes the cumulative effects of TROA and the other alternatives on waterfowl and shorebirds according to action category. The qualitative analysis is based on the analysis of indicators and effects discussed in chapter 3.

a. Urban Development and Land Use

No Action: Effects would be related directly to habitat-related resources such as streamflow, storage, water quality, and riparian canopy, and inversely related to recreation.

b. Water Rights Acquisitions and Transfers

No Action: Reservoir storage and related waterfowl habitat would not be affected.

TROA: TROA operations would likely maintain greater storage in reservoirs than under *No Action*.

c. M&I Water

No Action: Effects on waterfowl and shorebirds would depend on changes in volume and timing of reservoir storage and releases.

d. Ecosystem Restoration

No Action: Benefits would accrue from projects dedicated to wetlands restoration.

e. Flood Control

No Action: Some benefits could accrue from flood attenuation projects that promote wetlands.

f. Water Quality

No Action: Reduction in loading to impoundments could enhance habitat conditions.

g. Climate

No Action: No cumulative effects from climate change are identified for the period of analysis.

2. Potential Cumulative Effects of TROA

TROA would not affect any current or proposed waterfowl or shorebird management plan and would have no cumulative effect on those resources in the study area. No additional effects relative to waterfowl or shorebird management were identified, and, so, no significant cumulative effects would be anticipated. Indirect benefits of TROA relative to waterfowl or shorebird resources could accrue as a result of habitat improvement projects that could be implemented at a future time using the habitat restoration fund provided for in TROA or using LVPLFWF; the extent of benefits would depend on the types and success of projects selected.

G. Riparian Habitat and Riparian-Associated Wildlife

As presented in chapter 3, TROA would have no significant effect on riparian habitat and riparian-associated wildlife in the study area. TROA generally would provide benefits to these resources along reaches of the Truckee River, particularly in dry and extremely dry hydrologic conditions.

1. Comparison of Alternatives by Action Category

The following section summarizes the cumulative effects of TROA and the other alternatives on riparian habitat and riparian-associated wildlife according to action category. The qualitative analysis is based on the analysis of indicators and effects discussed in chapter 3.

a. Urban Development and Land Use

No Action: As riparian habitats within Truckee Meadows and Truckee urban areas have already been substantially affected, future degradation would be limited. Additional loss of riparian habitats along tributaries would be possible if not mitigated.

b. Water Rights Acquisitions and Transfers

No Action: Effects on riparian habitat would depend on timing, amount, and location of additional diversions in the upper basin.

TROA: TROA operations could enhance habitat conditions through management of dedicated Credit Water releases.

c. M&I Water

No Action: If M&I demands exceed projected amounts, effects on riparian habitats and associated species along upstream reaches of Truckee River likely would be adverse.

TROA: TROA operations could enhance habitat conditions through management of dedicated Credit Water releases.

d. Ecosystem Restoration

No Action: Restoration projects could enhance riparian habitat throughout the basin, particularly in the Truckee River from Truckee Meadows to Pyramid Lake.

TROA: Additional benefits could accrue from use of LVPLFWF and habitat restoration fund, and from management of dedicated Credit Water releases (e.g., ramping of lower river flows to enhance cottonwood survival).

e. Flood Control

No Action: Flood control could have little effect or could provide substantial benefits downstream from Reno if the emphasis is on ecosystem restoration.

f. Water Quality

No Action: Reduction in loading to streams could enhance habitat conditions.

g. Climate

No Action: No cumulative effects from climate change are identified for the period of analysis.

2. Potential Cumulative Effects of TROA

TROA would have no significant adverse effect on riparian habitat and associated species and would directly benefit those resources in the study area. Cumulative effects of TROA relative to riparian habitat and associated species also would likely be beneficial as a result of habitat improvement projects that could be implemented at a future time using the habitat restoration fund provided for in TROA or using LVPLFWF; the extent of benefits would depend on the types and success of projects selected.

H. Special Status Species

As presented in chapter 3, TROA would have no significant adverse effect on special status species in the study area. In particular, TROA would generally provide benefits to cui-ui in the lower Truckee River and Pyramid Lake and LCT in the Truckee River by providing additional inflow to Pyramid Lake and improving riparian and riverine habitat in and along the river, particularly in dry and extremely dry hydrologic conditions. The extent of Tahoe yellow cress habitat would be about the same under TROA as under No Action. Effects on other wildlife and plant species would be as described for other biological resources.

1. Comparison of Alternatives by Action Category

The following section summarizes the cumulative effects of TROA and the other alternatives on special status species according to action category. The qualitative analysis is based on the analysis of indicators and effects discussed in chapter 3.

a. Urban Development and Land Use

No Action: Effects would be related directly to impacts on habitat-related resources such as streamflow, water quality, sedimentation, and riparian canopy, and inversely related to recreation.

b. Water Rights Acquisitions and Transfers

No Action: Effects on special status species would depend on timing, amount, and location of additional diversions in the upper basin.

TROA: TROA operations could enhance habitat through management of dedicated Credit Water releases.

c. M&I Water

No Action: If M&I demands exceed projected amounts, effects on special status species along upstream reaches of Truckee River likely would be adverse.

TROA: TROA would provide better assurance of meeting water needs, and operations could enhance habitat through management of dedicated Credit Water releases.

d. Ecosystem Restoration

No Action: Restoration projects could enhance special status species throughout the basin, particularly in the Truckee River from Truckee Meadows to Pyramid Lake.

TROA: Additional benefits could accrue from use of LVPLFWF and habitat restoration fund, and from management of dedicated Credit Water releases (e.g., ramping of lower river flows to enhance cottonwood survival).

e. Flood Control

No Action: Flood control could have little effect, or could provide substantial benefits downstream from Reno if the emphasis is on ecosystem restoration.

f. Water Quality

No Action: Reduction in loading to water bodies could enhance habitat conditions.

g. Climate

No Action: No cumulative effects from climate change are identified for the period of analysis.

2. Potential Cumulative Effects of TROA

TROA would have no significant adverse effect on special status species and would directly benefit those resources in the study area. Cumulative effects of TROA relative to riverine and riparian habitat and associated species would also likely be beneficial as a result of habitat improvement projects that could be implemented at a future time using the habitat restoration fund provided for in TROA or using LVPLFWF; the extent of benefits would depend on the types and success of projects selected. Projects that

improve habitat conditions in, and provide additional water to, the lower Truckee River and Pyramid Lake would provide direct benefits for the conservation of Pyramid Lake fishes.

I. Cumulative Effects on Recreation by Alternative

As presented in chapter 3, TROA would have no significant adverse effect on recreation in the study area.

1. Comparison of Alternatives by Action Category

The following section summarizes the cumulative effects of TROA and the other alternatives on recreation according to action category. The qualitative analysis is based on the analysis of indicators and effects discussed in chapter 3.

a. Urban Development and Land Use

No Action: Expanding populations and urban areas would restrict access to recreation sites and increase crowding and competition for the local resources; quality of the recreation experience would depend, in part, on resource management agencies.

TROA: Recreational pool targets in TROA, enhancement of minimum streamflows (releases), and the use of dedicated resource Credit Water could help meet some of the increased demands for recreation as the population increases, particularly in dry hydrologic conditions.

b. Water Rights Acquisitions and Transfers

No Action: Effects on recreation would depend on timing, amount, and location of additional diversions in the upper basin.

TROA: TROA operations would maintain greater upstream reservoir storage and enhance streamflows through minimum flows and management of Credit Water releases. Effects on Lahontan Reservoir would be minimal.

c. M&I Water

No Action: Effects on recreation would depend on activity, location, season, and demographic trends.

d. Ecosystem Restoration

No Action: Beneficial effects could accrue from additional areas for angling and river boating access, and enhanced fish habitat could enhance the angling experience.

TROA: Implementation of additional projects using LVPLFWF and habitat restoration fund and management of dedicated Credit Water releases could provide additional benefits.

e. Flood Control

No Action: Flood control projects could be developed to provide recreation opportunities, access, and facilities.

f. Water Quality

No Action: Several projects in the study area could improve river water quality and, thus, enhance the quality of the recreation experience.

TROA: Management of dedicated Credit Water releases could further enhance reservoir and stream-based recreation.

g. Climate

No Action: No cumulative effects from climate change are identified for the period of analysis.

2. Potential Cumulative Effects of TROA

TROA would not affect any current or proposed recreation management plan and would have no direct cumulative effect on recreation in the study area. No additional effects relative to fish or fishery management were identified and so no significant cumulative effects would be anticipated. Indirect benefits of TROA relative to recreation could accrue as a result of riverine and riparian habitat improvement projects that could be implemented at a future time using the habitat restoration fund provided for in TROA or using LVPLFWF; the extent of benefits would depend on the types and success of projects selected.

J. Cumulative Effects on Economic Environment by Alternative

As presented in chapter 3, TROA would have no significant adverse effect on the economic environment in the study area. Any reduction in hydroelectric power revenues would be compensated pursuant to provisions of TROA.

1. Comparison of Alternatives by Action Category

The following section summarizes the cumulative effects of TROA and the other alternatives on the economic environment considered together with the actions previously identified according to action category. The qualitative analysis is based on the analysis of indicators and effects discussed in chapter 3.

a. Urban Development and Land Use

No Action: Local economies and urban development likely would respond to regional economic and demographic trends.

b. Water Rights Acquisitions and Transfers

No Action: No additional impacts would be expected because of the assumed demographic trend.

c. M&I Water

No Action: No additional impacts would be expected because of the assumed demographic trend.

d. Ecosystem Restoration

No Action: Local economies would benefit to the extent that recreation is enhanced.

e. Flood Control

No Action: Benefits could accrue from avoidance of property damage or loss.

f. Water Quality

No Action: Water quality projects could incrementally aid the regional economy by reducing costs of environmental improvement projects and promoting recreation.

g. Climate

No Action: No cumulative effects from climate change are identified for the period of analysis.

2. Potential Cumulative Effects of TROA

TROA would have no direct cumulative effect on the economic environment in the study area. While indirect benefits of TROA as identified in the recreation section could enhance local economies, no significant cumulative effects would be anticipated.

K. Cumulative Effects on Social Environment by Alternative

As presented in chapter 3, TROA would have no significant adverse effect on the social environment in the study area. Trends in water use changes, M&I demands, and urban development are projected to reflect the trend of population increase. TROA would not promote population growth, but would provide a more secure M&I drought supply than the other alternatives.

1. Comparison of Alternatives by Action Category

The following section summarizes the cumulative effects of TROA and the other alternatives on the social environment according to action category. The qualitative analysis is based on the analysis of indicators and effects discussed in chapter 3.

a. Urban Development and Land Use

No Action: Regional and local plans would be designed to accommodate projected increase in population. However, the M&I drought supply could require restrictive conservation measures

TROA: TROA would provide a more secure M&I drought supply for Truckee Meadows.

b. Water Rights Acquisitions and Transfers

No Action: Regional and local plans would be designed to accommodate projected increase in population.

c. M&I Water

No Action: M&I water demand is based on projected population.

d. Ecosystem Restoration

No Action: Aesthetic appeal of stream reaches could be enhanced, but to an unmeasurable degree.

TROA: Implementation of additional projects using LVPLFWF and habitat restoration fund could further enhance the aesthetic appeal of the Truckee River.

e. Flood Control

No Action: Measures could enhance aesthetic appeal and provide a sense of public safety.

f. Water Quality

No Action: Aesthetic appeal of stream reaches could be enhanced.

TROA: Management of dedicated Credit Water releases could further enhance water quality, particularly during the summer.

g. Climate

No Action: No cumulative effects from climate change are identified for the period of analysis.

2. Potential Cumulative Effects of TROA

As presented in chapter 3, TROA would have no direct cumulative effect on the social environment in the study area. Indirect benefits of TROA as identified in the riparian habitat section could enhance the aesthetic qualities of the study area, and no significant cumulative effects would be anticipated.

L. Cultural Resources

As presented in chapter 3, TROA would have no significant adverse effect on cultural resources in the study area.

1. Comparison of Alternatives by Action Category

The following section summarizes the cumulative effects of TROA and the other alternatives on cultural resources according to action category. The qualitative analysis is based on the analysis of indicators and effects discussed in chapter 3.

a. Urban Development and Land Use

No Action: Most known cultural resources have either been mitigated or protected in urban areas or are distant from areas designated for development. If National Register of Historic Places (NRHP) properties or NRHP-eligible properties would be threatened by any proposed development, the responsible entities—governmental or private—must consult with the State Historic Preservation Office (SHPO) to negotiate protective measures.

b. Water Rights Acquisitions and Transfers

No Action: Acquisitions, transfers, or exercise of water rights would not affect cultural resources.

c. M&I Water

No Action: No direct effects to known or unknown cultural resources have been identified.

d. Ecosystem Restoration

No Action: Effects would occur if any proposed restoration action(s) would threaten known or unknown cultural resources.

e. Flood Control

No Action: Potential actions could expose or submerge resources, but to an unknown degree.

f. Water Quality

No Action: No cumulative effects are identified for the period of analysis.

g. Climate

No Action: No cumulative effects from climate change are identified for the period of analysis.

2. Potential Cumulative Effects of TROA

As presented in chapter 3, TROA would have no direct cumulative effect on cultural resources in the study area. Indirect benefits of TROA as identified in the riparian habitat section could stabilize stream banks in the study area and help protect cultural resources, and no significant cumulative effects would be anticipated.

M. Indian Trust Resources

TROA would have no significant adverse effect on Indian trust resources, particularly with respect to biological resources in the lower Truckee River and Pyramid Lake, i.e., Pyramid Lake fishes and riparian habitat and associated species, and would directly benefit those resources in the study area. TROA would have no effect on water rights on Fallon Indian Reservation. Cumulative effects of TROA relative to Indian trust resources also would likely be beneficial as a result of habitat improvement projects that could be implemented at a future time using the habitat restoration fund provided for in TROA or using LVPLFWF; the extent of benefits would depend on the types and success of projects selected.

VII. Conclusion

TROA would allow parties to exercise water rights for their respective benefits individually while still in a prescribed, regulated, coordinated, and collaborative manner. The fact that substantial operational flexibility is provided in the exercise of existing water rights would allow opportunity to tailor operations to maximize (or at least enhance) benefits for specified resources. By creating credit storage and using existing facilities more flexibly, TROA would allow opportunity to plan (i.e., store water) for future situations. By not constructing facilities, only providing operational flexibility, TROA would not preclude future (and technologically more advanced) measures to provide additional water or improve water quality from being implemented. TROA also would allow opportunity to enhance benefits for economic, social, biological, and trust resources in the study area, which previously had no water rights or had water rights of junior priority. Establishment of the habitat restoration fund (firm amount) and opportunity to add measurably to LVPLFWF (variable amount) could assist in restoring, enhancing, and protecting environmental values and processes long affected by more narrowly focused operations. As no significant adverse cumulative effects have been

identified for the implementation of TROA within the context of the proposed Negotiated Agreement and TROA would have beneficial effects on resources in the study area, no mitigation would be necessary and none is proposed.

Chapter 5

CONSULTATION AND COORDINATION

This chapter serves as the public involvement summary report of activities on the environmental compliance process pursuant to the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). It also includes information on consultation and coordination activities.

I. Study Participants

As discussed in chapter 1, the co-lead agencies for this study are the U.S. Department of the Interior (Interior) and California. This document was prepared by three Interior bureaus—Bureau of Reclamation (Reclamation), Fish and Wildlife Service (FWS), and Bureau of Indian Affairs—and by California Department of Water Resources (CDWR).

A. Signatories

The following entities participated in the negotiation and development of TROA and are the anticipated signatories (those identified by * are mandatory signatories):

- Interior*
- California*
- Nevada*
- Truckee Meadows Water Authority*
- Pyramid Lake Paiute Tribe of Indians (Pyramid Tribe)*
- Sierra Pacific Power Company (Sierra Pacific)
- Washoe County Water County District
- City of Reno, Nevada
- City of Sparks, Nevada
- City of Fernley, Nevada
- Washoe County, Nevada
- Sierra Valley Water Company
- Carson-Truckee Water Conservancy District
- North Tahoe Public Utility District
- Truckee Donner Public Utility District

B. Cooperating/Responsible Agencies

Most of the following are cooperating or responsible agencies and have jurisdiction by law over some aspect of TROA or contributed special expertise to the environmental impact statement/environmental impact report (EIS/EIR):

- U.S. Army Corps of Engineers
- U.S. Environmental Protection Agency
- U.S. Forest Service
- U.S. Geological Survey
- Bureau of Land Management
- California Department of Fish and Game
- California State Water Resources Control Board
- California State Lands Commission
- Lahontan Regional Water Quality Control Board
- California State Historic Preservation Officer
- Nevada Department of Conservation and Natural Resources
 - Nevada Division of Water Resources
- Nevada Department of Wildlife
- Nevada State Historic Preservation Office
- Washoe County, Nevada
- Truckee Meadows Water Authority
- Tahoe Regional Planning Agency

C. Interested Parties

The following non-Federal agencies and entities with an interest in the Truckee River and reservoir operations or with technical expertise contributed to the EIS/EIR:

- Truckee-Carson Irrigation District
- Churchill County, Nevada
- Fallon, Nevada
- Carson Water Subconservancy District
- Lahontan Valley Environmental Alliance
- Newlands Water Protective Association
- Lyon County, Nevada
- California Resources Agency
- Del Oro (Donner Lake) Water Company
- Glenshire Mutual Water Company
- South Tahoe Public Utility District
- Truckee River Basin Water Group
 - Tahoe-Truckee Sanitation Agency

- Town of Truckee
- Nevada County
- Placer County
- Sierra County
- North Tahoe Public Utility District
- Tahoe City Public Utility District
- Truckee Donner Public Utility District
- Truckee Donner Recreation and Park District
- Northstar Community Service District
- Sierra Valley Water Company
- Alpine Springs County Water District
- Squaw Valley Mutual Water Company
- Squaw Valley Public Service District
- Poulsen Water Company
- Placer County Water Agency
- Tahoe Resource Conservation District

II. Agency Consultation

Concurrent with preparation of this document, agency coordination and consultation have been or are in the process of being conducted and are described in this section.

A. Fish and Wildlife Coordination Act Consultation

The Fish and Wildlife Coordination Act (FWCA) requires Federal agencies to coordinate with FWS and State wildlife agencies during the planning of new projects or for modifications of existing projects so that wildlife conservation receives equal consideration with other features of such projects throughout the agencies' planning and decision making processes (44 *Federal Register* [FR] 29300). Wildlife resources will be conserved in action agency project planning and approval by minimizing adverse effects, compensating for wildlife resources losses, and enhancing wildlife resource values (44 FR 29307).

Reclamation's objectives regarding fish and wildlife resources are to afford Federal and State fish and wildlife agencies the opportunity to participate actively in planning for projects that could affect fish and wildlife resources, to ensure that the public is fully informed regarding fish and wildlife resource matters and that their views are considered, and to ensure that fish and wildlife resources are fully considered in Reclamation's decisionmaking process by integrating such considerations into project planning, NEPA compliance procedures, financial and economic analyses, authorizing documents, project implementation, and during operation and maintenance of projects. FWCA compliance can be carried out prior to or at the same time Reclamation is complying with NEPA regulations.

Compliance with FWCA requires the following (44 FR 29307):

- Consultation between FWS, State fish and wildlife agencies, and the action agencies
- Opportunity for FWS and State wildlife agencies to report their recommendations
- Consideration of FWCA report recommendations
- Incorporation of the FWCA report as an integral part of the decisionmaking process

Chapters 1 and 2 and the “Biological Resources” sections of chapter 3 of this document, including the sections on mitigation and conservation measures, are the same as would appear in the main body of a draft FWCA report. The only portion not included is a list of nonmandatory enhancement measures to be recommended for implementation should opportunities arise. Implementation of TROA would provide a net benefit for fish and wildlife resources, including federally listed fish species. In coordination with California Department of Fish and Game and Nevada Department of Wildlife, FWS has recommended establishment of an aquatic and biological resources monitoring program as a nonmandatory enhancement measure to facilitate coordination among participating monitoring agencies. The purpose of this monitoring is to document the status and trends of biological resources in stream reaches that are influenced by Truckee River reservoirs as identified in TROA. This coordination will promote informed decisionmaking for managing stream flows and reservoir levels, consistent with the provisions of TROA, for the protection, maintenance, and enhancement of aquatic and riparian biological resources in the subject stream reaches. In combination with TROA itself and the NEPA compliance conducted for it, consideration of this recommendation constitutes full compliance with FWCA.

B. Endangered Species Act Consultation

Section 7 of the Endangered Species Act of 1973, as amended (ESA), prohibits Federal agencies from authorizing, funding, or carrying out activities that are likely to jeopardize the continued existence of a listed species or destroy or adversely modify its critical habitat. By consulting with FWS before initiating projects, agencies review their actions to determine if these could adversely affect listed species or their habitat. Through consultation, FWS works with other Federal agencies to help design their programs and projects to conserve listed and proposed species. Regulations for the consultation process can be found at 50 Code of Federal Regulations (CFR) part 402.

Because a number of listed species either occur on Federal lands or are potentially affected by Federal activities, FWS coordination with other Federal agencies is important to species conservation and may help prevent the need to list candidate species.

Consultation with FWS pursuant to Section 7 of ESA is required before the Secretary of the Interior (Secretary) may sign TROA to ensure it will not jeopardize the continued existence of any listed species or destroy or adversely modify its critical habitat. FWS has reviewed the proposed action and concluded that formal consultation is not necessary. A letter from FWS to Reclamation concurring that the proposed action “is not likely to adversely affect cui-ui, Lahontan cutthroat trout, or bald eagle” is included as Attachment H. This terminates the consultation process, and no further ESA compliance is necessary.

The California Endangered Species Act (CESA), California Fish and Game Code Section 2050 *et seq.*, imposes similar obligations on California State agencies, and operates in conjunction with the Federal ESA. Species may be listed under both acts (both State and federal laws would apply) or under only one act. Section 2080 of the California Fish and Game Code prohibits the “take” of a plant or animal listed or proposed as threatened, endangered, or rare (rare applies to plants). The California Department Fish and Game (CDFG) administers the act and authorizes “take” through Section 2081 incidental take permits. CESA allows for “take” incidental to otherwise lawful development projects. CESA emphasizes early consultation to avoid potential impacts to rare, endangered, and threatened species and to develop appropriate mitigation planning to offset project caused losses of listed species populations and their essential habitats. The assessment of project effects on species listed under both ESA and CESA is addressed in FWS’s Section 7 Concurrence Letter. However, with regard to those species listed only under CESA, CDWR has consulted with CDFG throughout the EIS/EIR process and was involved in the TROA negotiations. CDFG has affirmed that TROA would have no effect on State-listed endangered or threatened species, and that CDWR has satisfied its obligations under CESA.

C. Cultural Resources Consultation

Federal law requires Federal agencies to consider the effects of their undertakings on cultural resources. The National Historic Preservation Act of 1966 (NHPA), as amended, is the basic Federal law governing preservation of cultural resources of national, regional, State, and local significance. Specifically, section 106 of NHPA requires each Federal agency to consider the effect of its actions on “any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register.” Furthermore, an agency must give the Advisory Council on Historic Preservation, an independent Federal agency created by the NHPA, an opportunity to comment on any undertakings that could affect historic properties. Procedures for meeting section 106 requirements are defined in 36 CFR 800. Other Federal legislation further promotes and requires the protection of historic and archeological resources by the Federal Government. Among these laws are the Archeological Resources Protection Act of 1979 and the Native American Graves Protection and Repatriation Act of 1990, both as amended.

In 1995, discussions began with the Fallon Paiute-Shoshone Tribes, Pyramid Tribe, Reno-Sparks Indian Colony, and Washoe Tribe regarding traditional cultural properties

that may be in the study area. Discussions continue as needs dictate. In May 2003, contact was reinitiated with the Pyramid Lake Paiute Tribal Department of Water Resources to hear new concerns about habitat and spawning issues with the lake's native cui-ui and Lahontan cutthroat trout (LCT). Discussions also were initiated with the Nevada and California State Historic Preservation Offices (SHPO); these discussions are ongoing as needs dictate. For example, requests for any documented cultural resource surveys since 1995 were made with the appropriate regional information centers of the California Historical Resource Information System (a division of the California SHPO), as well as the Nevada SHPO. These findings have been incorporated into this final EIS/EIR.

In compliance with CEQA, in April 2004 Reclamation contacted California's Native American Heritage Commission to request a sacred lands file check for the four California counties in the study area. A records search conducted in June 2004 by the commission of its sacred lands files did not indicate the presence of any American Indian cultural resources or sacred lands in the study area. In its report, the commission included a list of Washoe tribal contacts for future cultural resource or sacred lands consultations, if needed. Contact by Reclamation for the sacred lands file search and California's response meet all cultural resource requirements as directed by CEQA. Known cultural resources and probable impacts are described under "Cultural Resources" in chapter 3; this information is supplemented in the Cultural Resources Appendix. Consultation on significant adverse effects and mitigation related to a final action, if any, will be reinitiated by the responsible entities as necessary. Acceptance of the final EIS/EIR will indicate that Reclamation has fulfilled all of its cultural resources consultation responsibilities under sections 110 and 106 of NHPA, as amended.

D. Indian Trust Resources Consultation

As discussed in chapter 3, Indian trust resources are legal interests in property or natural resources held in trust by the United States for Indian tribes or individuals. The Secretary is the trustee for the United States on behalf of Indian tribes. All Interior agencies share the Secretary's duty to act responsibly to protect and maintain Indian trust resources reserved by or granted to Indian tribes or Indian individuals by treaties, statutes, and Executive orders.

Consultation with individual Indian tribes in the study area includes the following:

- Pyramid Tribe: Pyramid Lake Indian Reservation, which includes Pyramid Lake in Nevada.
- Reno-Sparks Indian Colony: Reno and Hungry Valley in Nevada.
- Fallon Paiute-Shoshone Tribes: Fallon Paiute-Shoshone Reservation and Fallon Colony in Nevada.

- Washoe Tribe of Nevada and California: colonies of Carson City, Dresslerville, Stewart, Washoe Ranch (in Nevada) and Woodsford (in California), Pine Nut allotments (in Nevada), and cultural interests at and near Lake Tahoe.

Known assets and effects are described under “Indian Trust Resources” in chapter 3. Consultation and coordination with the tribes will continue through completion of the NEPA process and during implementation of the Negotiated Agreement.

III. Input to Decisionmaking Process

Input to the decisionmaking process came from several sources, including the policy, legal, and technical representatives of the negotiators of the Negotiated Agreement and the public, including the Truckee River Basin Water Group (TRBWG), a local, community-based group that provides a forum for public participation in the decisionmaking process.

A. Negotiators

The negotiators represent the interests of a broad spectrum of agencies and entities that would be affected by modifying operations of Truckee River reservoirs. The negotiators and various subgroups have met periodically to discuss issues and to prepare and review successive drafts of the Negotiated Agreement. The most recent agreement was completed on August 28, 2007 (i.e., proposed Negotiated Agreement), represented in this document as the TROA Alternative—the proposed action and preferred alternative.

A steering committee, made up of representatives of the negotiators, lead agencies, cooperating agencies, and other participating agencies and organizations, met from May 1992 to 1996. The steering committee was considered a first line of public involvement and provided input from individual member agencies and their publics.

B. Truckee River Basin Water Group

Section 15201 of the CEQA Guidelines states, “Public participation is an essential part of the CEQA process.” To provide a mechanism for such public participation during negotiation of the agreement and preparation of the final EIS/EIR, TRBWG regularly conducts meetings that are open to the public for discussion, review, and comment on agreement-related issues.

Each of the participants represents and comments as part of his or her constituent interest group. The open exchange of information and ideas serves both the community and Federal and State entities whose programs may affect local residents. TRBWG is not an advisory group under the Federal Advisory Committee Act. Input from the group is provided to CDWR and, through it, to the management team and technical analysts.

C. Public Involvement

Public involvement is a process by which interested and affected individuals, organizations, agencies, and governmental entities are consulted and included in the decisionmaking process. The public involvement process is used to solicit public input on issues surrounding the action and alternatives development as well as to inform the public regarding studies performed for the document.

The objectives of the structured public involvement process were initially laid out in a plan of study dated August 1992. Process details were defined in the public involvement plan, a document created early in the course of the study. Public involvement is an ongoing effort, and the plan has been updated to reflect the changes in process in NEPA/CEQA compliance.

1. Scoping Process

An early and open public scoping process is required as part of EIS preparation (49 CFR, part 1501.7) and promoted as part of EIR preparation (California Public Resources Code, section 21082.1). Public scoping is a continuing and integral part of the decision process, environmental review, and documentation for the final EIS/EIR. Scoping is designed to encourage the general public and governmental agencies to:

- Identify issues, concerns, and possible impacts
- Identify existing information sources
- Develop alternatives

a. Notice of Intent/Notice of Preparation

The formal public NEPA/CEQA scoping process began with a publication of a Notice of Intent (Federal) in the FR on July 21, 1991, and publication of a Notice of Preparation (California) on June 27, 1991. At the same time, a news release was issued from Reclamation's Mid-Pacific Regional Office. Both the Notice of Intent and the news release announced locations and times for public scoping meetings.

The Notice of Intent for the revised draft environmental impact statement/environmental impact report (DEIS/EIR) was published in the FR on April 15, 2004, and a Notice of Preparation was published on April 16, 2004. At the same time, a news release was issued from Reclamation's Mid-Pacific Regional Office. The Notice of Intent, Notice of Preparation, and press release announced the points of contact and a Web site for further information.

b. Public Scoping Meetings

Five public scoping meetings were held July 22-25, 1991, in Truckee and South Lake Tahoe, California; and Reno, Nixon, and Fallon, Nevada. A total of 130 people attended the meetings. Oral comments were recorded, and written comments were received from

13 individuals. The public was specifically asked to identify the issues, concerns, and alternatives to be addressed in the DEIS/EIR. Comments received as a result of the public scoping meetings are contained in the Report on Scoping Comments, TROA, dated November 1991.

Public and agency input received from the scoping meetings was used to define the major public issues related to modifying operations of Truckee River reservoirs. The following were identified as major public issues:

- Endangered, threatened, and candidate species
- General fish and wildlife
- Recreational use
- Water quality

These issues were considered by the negotiators during development of the February 1998 TROA Alternative and alternatives analyzed as part of the Report to the Negotiators. (See chapter 2.)

2. Other Public Meetings

During the course of the studies, other public meetings were held to confirm the analytical approach for major issues and to invite public input into the process of identifying alternatives to be evaluated.

Four public meetings were held August 2-5, 1993, one each in Truckee, California, and Reno, Nixon, and Fallon, Nevada. The purpose of the meetings was to review the public issues, describe the alternatives identification process, and solicit public input on identifying alternatives.

In addition to the public meetings, separate meetings were held in Nixon, Nevada, with representatives of the Pyramid Tribe to ensure a clear understanding of public issues related to the tribe and to identify Indian trust resources. This consultation is a continuing process, as described in chapter 3, "Indian Trust Resources."

3. Public Meetings and Hearings Following Release of DEIS/EIR

On March 13, 1998, Interior and California released the DEIS/EIR (dated February 1998) for public review and comment. The comment period for this document was originally scheduled to end in May 1998, but was extended through June 29, 1998, at the request of several negotiators.

In March 1998, shortly after release of the document, public information meetings were held at seven locations in the study area to explain the organization, content, and general conclusions of the document. The meetings were held in South Lake Tahoe, Tahoe City, and Truckee, California; and in Nixon, Sparks, Fernley, and Fallon, Nevada.

Public hearings were held in April 1998 to receive public comments on the DEIS/EIR. These hearings were held in Elks Point, Nevada; Truckee, California; Fallon, Nevada; Fernley, Nevada; Nixon, Nevada; and Sparks, Nevada. Written comments on the draft document and proposed action were received through June 1998. In all, 27 public speakers commented at the hearings and 116 comment letters and one phone message were received on the DEIS/EIR.

The comments received on the February 1998 DEIS/EIR were used to help focus and refine the revised DEIS/EIR. Additionally, copies of all comments were provided to the negotiators for their information. Those comments addressing the text of or concepts in the agreement required consideration by the parties because any changes to the agreement had to be accepted by at least the mandatory signatories before they could become part of the proposed action. Comments received on negotiation issues influenced subsequent negotiations. In 2003, TRBWG requested and received copies of the comments under the Freedom of Information Act.

Much effort went into addressing comments received. As a result, numerous modeling changes were made and the scope of the revised DEIS/EIR study was expanded to address a portion of Lahontan Valley.

The comments were divided into two categories: (1) general comments about the NEPA/CEQA process and the DEIS/EIR and (2) comments regarding the agreement and negotiation process. NEPA/CEQA comments were further categorized by resource: hydrology; water quality; sediment, biological resources; recreation; and economic, social, and cultural resources. Table 5.1 summarizes NEPA/CEQA-related comments.

TROA and its authorizing legislation, Public Law (P.L.) 101-618, only allow TROA to be changed in the same manner in which it was negotiated and adopted. Therefore, any amendments to TROA itself (made after it enters into effect) would have to be negotiated and agreed to by the signatories.

Eighty-four comments related to the agreement negotiation process were submitted during the 1998 comment period. Comments focused on the following:

- Depletion (measuring depletion impacts)
- Donner Lake issues (surface elevation, fish habitat and flows, lake ownership)
- Flood potential and flood control (flood control plans, set-back distance, groundwater development)
- Instream flows and fish/wildlife issues (mandatory minimum instream flows for fish and habitat, LCT recovery plan, ramping of reservoir releases, providing cool water in streams for fish, flow, and temperature monitoring, minimum pools in reservoirs for fish and habitat, impacts to fishery, oversight of releases, penalties for failure to comply with TROA)

Table 5.1—Summary of NEPA/CEQA comments received on DEIS/EIR

Category	Number received	Process-related concerns	Issue considerations
NEPA - related comments	11	Whether the proposed action reviewed by the DEIS/EIR was properly described Completeness of the review process	Local effects Flood control Water rights
Water quality	8	Fuller description of the process used to analyze/model water quality If this detailed information was available to the public	Water quality effects due to erosion Downstream flows Reduced streamflows in dry years
Sediment	10	Accuracy and completeness of the data used Availability of the source (modeling) data	Sediment effects due to early releases Sediment changes may effect LCT spawning/rearing, cui-ui runs, and shoreline erosion
Biological resources	141	Accuracy, completeness and source of the data used Availability of the source (modeling) data Conflicting references/ explanations, apparent discrepancies	Effects on species including: trout (rainbow, LCT and brown), white faced ibis, gulls, ducks, mountain yellow legged frog, bald eagle, geese, marten, osprey, white pelican, and cui-ui Questions related to effects and impacts on Tahoe yellow cress and cottonwood Effects on fish and other water related species, including: releases, stream and river flows, recovery, spawning, water temperature, passage and erosion, and others
Recreation resources	27	Accuracy and completeness of the data or statements	Effects on rafting, boating, windsurfing, fishing, and scenery Effects of increased or decreased flows on recreation activities and economic benefits It was noted that TROA was restricted in what it could do regarding recreation activities in that it may not interfere with the exercise of vested water rights unless those rights are voluntarily relinquished
Economic resources	30	Accuracy and completeness of the data or statements	Whether economic effects were adequately considered in such areas as fishing/recreation, property damage due to flood, logging/sawmill operations, visitation response to water levels, conversion of agriculture rights to municipal and industrial water use, hydroelectric power generation, additional storage for Sierra Pacific, and local economic impacts (versus regional)
Cultural resources	31	Accuracy and completeness of the data used (such comments often focused on whether a location (road, lake, dam, etc.) or term was correctly stated)	Whether a particular analysis was extensive enough in such areas as drainage problems, defining the primary area for the cultural resource, ethnographic consideration, and the effects of secondary natural transformations

- Mitigation (clarify/incorporate process to mitigate significant adverse effects to environment, monitor environmental factors for impacts)
- Negotiation process (insufficient public participation or input; clarify process of identifying potential signatories and negotiating the agreement; Sierra Pacific had undue influence in drafting TROA; having a provision for changing the agreement after it is signed; the process should have included a provision for performance criteria and monitoring)
- Newlands Project (Truckee Canal diversions)
- Hydroelectric power generation (clarify Sierra Pacific's waiver of single-purpose power and compensation for lost power)
- Recreation (minimum reservoir pools for recreation, adequate flows for recreation such as rafting, preserving recreation)
- Relation to other laws (compliance with State laws, P.L. 101-618, and Clean Water Act)
- Water quality (effect on water quality of Lake Tahoe and Truckee River downstream from Lake Tahoe; inadequate guarantees for water quality or on ways to measure impacts, impacts from sedimentation)
- Water rights (increased allocation to California; allocation percentage counted for snowmaking in California; California water spill priority, private ownership rights)

4. Public Meetings and Hearings Following Release of Revised DEIS/EIR

The revised DEIS/EIR for the TROA was filed with the Environmental Protection Agency on August 23, 2004, and the California State Clearinghouse on August 26, 2004. A Notice of Availability and Public Hearings appeared in the FR August 25, 2004. Three news release announcing availability of the document and dates, times, and locations of open house meetings and/or public hearings were released on August 25, September 14, and October 14, 2004. Comments were scheduled to be received by October 29, 2004.

Approximately 400 copies of the revised DEIS/EIR were distributed to Nevada and California members of Congress, State senators, and assembly members; Federal, State, and local government agencies; Indian tribes; entities and organizations; power and water purveyors; environmental groups; libraries; and the general public. Open house public information workshops were held in Fernley and Reno, Nevada, on September 21; in Fallon, Nevada, on September 22; in Kings Beach and Truckee, California, on September 23; and in Nixon, Nevada, on October 1, 2004. The original comment period was extended to December 30, 2004, following requests from the public and several entities. A letter announcing the extension was mailed on October 26, 2004, to each recipient of

the revised DEIS/EIR. A news release announcing the extension of the comment period also was released on October 26, 2004. Notice of the comment period extension was published in the FR on November 10, 2004.

A total of 47 comment letters (paper or electronic) were received during the public comment period.

In addition, during the comment period, five public hearings were held: Monday, October 18, 2004, in Reno, Nevada; Tuesday, October 19, 2004, in Fernley, Nevada, and in Nixon, Nevada; Wednesday, October 20, 2004, in Truckee, California; and Thursday, October 21, 2004, in Fallon, Nevada. (A public hearing in Kings Beach, California, on October 21, 2004, was canceled due to a severe snow storm.) Eight speakers gave oral testimony at the first public hearing; one at the second public hearing; two at the third public hearing; none at the fourth hearing; and five at the fifth hearing. A total of nine entities provided *written* public hearing comments; these are included in the hearing record. Copies of the transcripts of the public hearing testimony and written public hearing comments and responses to the comments are included in the Comments and Responses Appendix.

A total of 567 individual comments were identified and addressed. The comment letters, transcripts of the public hearing testimony, and the written public hearing comments are reproduced in the Comments and Response Appendix, followed by responses to the individual comments.

5. Other Public Contact

On December 15, 2004, and January 13, 2005, Reclamation held two meetings at the TCID office in Fallon, Nevada. The purposes of these meetings were to review the revised DEIS/EIR, the Truckee River Operations Model and model runs used for that document, and the Draft Agreement.

The meetings were well-attended by TCID, representatives from Churchill County, Fallon, local interest groups, Nevada Department of Wildlife, and FWS-Stillwater National Wildlife Refuge. On March 17, 2005, a third meeting was held with TCID board members and staff at Fallon, Nevada. The purpose of this meeting was to complete the review of the October 2003 Draft Agreement. This meeting was also requested by TCID and was similarly well-attended.

In addition to the public scoping, meetings, and hearings, numerous contacts were made with the general public and agencies. These personal contacts, telephone calls, and mail provided input into various aspects of the study effort, particularly the cumulative effects analysis contained in chapter 4.

In 2004-05, Reclamation processed two requests for information under the Freedom of Information Act (FOIA) related to this study (FOIA No. BOR-2005-00003 and 4MPR011908).

DISTRIBUTION LIST

*asterisks indicate commenters on the revised draft environmental impact statement/environmental impact report

Congressional Delegations

Nevada

Senators

John Ensign

Harry Reid

Representatives

Shelly Berkley (District 1)

Dean Heller (District 2)

Jon C. Porter (District 3)

California

Senators

Barbara Boxer

Dianne Feinstein

Representatives

Wally Herger (District 2)

Daniel E. Lungren (District 3)

John T. Doolittle (District 4)

Doris Matsui (District 5)

Nevada State Senate

Mark E. Amodei (Capital District)

Bernice Mathews (Washoe District 1)

Mike McGinness (Central Nevada District)

William J. Raggio (Washoe District 3)

Randolph Townsend (Washoe District 4)

Maurice E. Washington (Washoe District 2)

Nevada State Assembly

Bernie Anderson (District 31)
Ty Cobb (District 26)
Tom Grady (District 38)
James Settlemeyer (District 39)
Sheila Leslie (District 27)
John Marvel (District 32)

California State Senate

David Cox (District 1)
Samuel Aanestad (District 4)
Michael Machado (District 5)
Darrell Steinberg (District 6)

California State Assembly

Richard Keene (District 3)
Ted Gaines (District 4)
Roger Niello (District 5)
David Jones (District 9)
Alan Nakanishi (District 10)
Tom Berryhill (District 25)

Federal Government Agencies

Bureau of Indian Affairs
Office of Trust and Economic Development, Washington, DC
Western Regional Office, Phoenix, AZ
Western Nevada Agency, Carson City, NV
Bureau of Land Management,
Nevada State Office, Reno, NV
Carson City Field Office, Carson City, NV
California State Office, Sacramento, CA
Council on Environmental Quality, Washington, DC

Federal Government Agencies – continued

Department of Agriculture

Forest Service, Washington, DC

Humboldt-Toiyabe National Forest, Carson City, NV

Truckee Ranger District, Truckee, CA

Tahoe National Forest, Nevada City, CA

Natural Resources Conservation Service

National Environmental Coordinator, Washington, DC

Carson-Storey County Extension Office, Carson City, NV

Department of the Army

Corps of Engineers

Sacramento District

Engineering Division, Water Management Section, Sacramento, CA;

Planning Division, Sacramento, CA;

Real Estate Division, Sacramento, CA;

Nevada Office, Reno, NV

Department of Commerce

NOAA

Office of Policy and Strategic Planning, Washington, DC

Department of Energy

Office of NEPA Oversight, Washington, DC

Department of Health and Human Services

Office of the Secretary, Washington, DC

Department of Housing and Urban Development, Washington, DC

Department of the Interior

Office of Environmental Policy and Compliance, Washington, DC;
Oakland, CA

Office of the Secretary, Washington, DC

Office of the Solicitor, Washington, DC; Sacramento, CA

Department of the Navy

Office of the Secretary, Washington, DC

Naval Air Station, Fallon, NV

Environmental Department, Fallon, NV

Department of Transportation, Washington, DC

Environmental Protection Agency

Headquarters, Washington, DC

Carson City, NV

Region IX, San Francisco, CA

Federal Energy Regulatory Commission, Washington, DC

Federal Highway Administration, Washington, DC

Federal Government Agencies – continued

Fish and Wildlife Service
California-Nevada Operations Office, Division of Endangered Species,
Sacramento, CA
Sacramento Fish and Wildlife Office, Sacramento, CA
Nevada Fish and Wildlife Office, Reno, NV
Stillwater National Wildlife Refuge, Fallon, NV

Geological Survey
Environmental Affairs Office, Reston, VA
Nevada State Office, Carson City, NV

Library of Congress, Washington, DC

National Park Service, Washington, DC

Ninth Circuit Nevada District Court Water Master's Office, Reno, NV

Office of Management and Budget
Associate Director for Natural Resources Program, Washington, DC

Western Area Power Administration
Sierra Nevada Region, Folsom, CA

State of Nevada Agencies

Department of Conservation and Natural Resources, Carson City*
Division of Environmental Protection
Division of State Lands*
Division of State Parks
Division of Water Resources
Natural Heritage Program

Department of Cultural Affairs, Carson City
State Historic Preservation Office

Department of Transportation
Environmental Services, Carson City

Department of Wildlife, Reno*
State Clearinghouse, Carson City

State of California Agencies

Board of Equalization, Valuation Division, Sacramento

Department of Justice, Sacramento

Department of Parks and Recreation, Sacramento
Office of Historic Preservation, Sacramento
Office of Historical Resources Commission, Sacramento
Sierra District, Tahoma

State of California Agencies – continued

Regional Water Quality Control Board
Lahontan Region, South Lake Tahoe*

The Resources Agency, Sacramento
Department of Fish and Game, Sacramento
Habitat Conservation Division, Rancho Cordova;
Sacramento Valley-Central Sierra Region, Rancho Cordova*
Department of Water Resources
Central District, Sacramento, CA
Fish and Game Commission, Sacramento, CA
Lands Commission, Sacramento, CA
Water Commission, Sacramento, CA

Secretary of State
State Archivist, Sacramento

State Clearinghouse, Sacramento*

Water Resources Control Board
Division of Water Rights, Sacramento*

County Government Agencies, Nevada

Binder & Associates, Folsom, CA (on behalf of Churchill County)*

Churchill County, Fallon*
County Manager*
Board of Commissioners*
District Attorney*

Douglas County, Minden
Board of Commissioners

Lyon County, Fernley
Board of Commissioners

Pershing County, Lovelock
Board of Commissioners

Storey County, Virginia City
Board of Commissioners

Washoe County, Reno
Board of Commissioners*
Department of Water Resources*

County Government Agencies, California

Alpine County, Markleeville
Board of Supervisors
Planning Department

County Government Agencies, California – continued

El Dorado County, Placerville
Board of Supervisors
Humboldt County, Eureka
Board of Supervisors
Mariposa County, Mariposa
Nevada County, Nevada City
Board of Supervisors
Placer County, Auburn*
Board of Supervisors
Department of Public Works*
Water Agency
Sierra County, Downieville
Assessor's Office, Downieville
Board of Supervisors, Sierra City
Department of Planning and Transportation, Tahoe City

Local Government Agencies, Nevada

Binder & Associates, Folsom, CA (on behalf of city of Fallon)*
City of Fallon*
Office of the Mayor*
City Attorney*
City of Fernley
Office of the Mayor
City of Reno
Office of the Mayor*
City of Sparks
Office of the Mayor*
Department of Public Works

Local Government Agencies, California

City of South Lake Tahoe
Department of Community Development
Office of the Mayor
Town of Truckee*
Office of the Mayor*
Truckee-Donner Recreation and Park District, Truckee

Indian Tribes

Fallon Paiute-Shoshone Tribe, Fallon, NV
Fredericks, Pelcyger and Hester, Louisville, CO (on behalf of Pyramid Lake Paiute
Tribe of Indians)*
Pyramid Lake Paiute Tribe of Indians, Nixon, NV*
Pyramid Lake Fisheries*
Department of Environmental Protection
Water Resources
Reno-Sparks Indian Colony, Reno, NV
Washoe Tribe of Nevada/California, Gardnerville, NV

Entities and Organizations

Adams Broadwell Joseph & Cardozo, Sacramento, CA
Bank of Walnut Creek, Walnut Creek, CA*
Bartkiewicz, Kronick and Shanahan, Sacramento, CA
Binder & Associates Consulting, Inc. (on behalf of city of Fallon, Churchill
County, TCID), Folsom, CA*
California Academy of Science, San Francisco, CA
California Conservation Corporation, Auburn, CA
California Cultural Arts Foundation, Sacramento, CA; San Francisco, CA
California Farm Bureau Federation, Sacramento, CA
California Fly Fishers Unlimited, Sacramento, CA*
California Redevelopment Association, Sacramento, CA
California School of Fly Fishing, Nevada City, CA
Camp Dresser & McKee, Inc., Tahoe City, CA
Canal Group, Reno, NV
Carollo Engineers, Walnut Creek, CA
Caughlin Ranch Home Owners Association, Reno, NV
CH2M Hill, Sacramento, CA
Chamber of Commerce, Reno, NV
Champions of the Truckee River, Reno, NV
Davis Enterprise, The, Davis, CA
DMB/Highlands Group, LLC, Truckee, CA
Donner Lake Property Association, Reno, NV
Dornbusch and Company, Inc., Berkeley, CA
ECO:LOGIC, Reno, NV
EDAW, Inc., Sacramento, CA

Entities and Organizations – continued

Fredericks, Pelcyger, and Hester, Louisville, CO (on behalf of Pyramid Lake
Paiute Tribe of Indians)*
Garcia and Associates, San Anselmo, CA
Golden Pacific Systems, Campbell, CA
Grizzly Peak Fly Fishers, El Cerrito, CA
Earl G. Hagadorn, Consulting Civil Engineer, Tahoe City, CA
Hall's Excavating, Truckee, CA
Hatch and Parent, Santa Barbara, CA
Heavenly Valley Ski Resort, Stateline, NV*
High Sierra Flycasters, Gardnerville, NV
Hoffman, Test, Guinan and Collier, Reno, NV
Hydro Turf Reno, Reno, NV*
Incline Village General Improvement District, Incline Village, NV
King and Taggart Law, Carson City, NV
Kronick, Moskovitz, Tiedemann and Girard, Sacramento, CA
Lahontan LLC, Truckee, CA
Mackedon and McCormick, Fallon, NV
Robert C. Maddox and Associates, Las Vegas, NV
Maguire & Pearce, Esquire, Phoenix, AZ
Martin Lebo, New Bern, NC
Martis Creek LLC, Truckee, CA
MBK Engineers, Sacramento, CA
McQuaid, Bedford and Van Zandt, LLP, San Francisco, CA (on behalf of TCID)*
Mechanics Bank, Richmond, CA*
Moonshine Inc., Truckee, CA
MWH, Sacramento, CA
Native American Heritage Commission, Sacramento, CA
NEA, a Division of Entrix, Inc., Sacramento, CA
Nevada Irrigation District, Grass Valley, CA
Nevada Policy Research Institute, Las Vegas, NV
Nevada Water Resources Association, Reno, NV
Newlands Water Protective Association, Inc., Fallon, NV*
North Lake Tahoe Bonanza, Incline Village, NV
Northstar Ski Area, Truckee, CA
Northwest Economic Associates, Sacramento, CA

Entities and Organizations – continued

Sue Oldham, Attorney for TMWA, Verdi, NV
Orinda Pacific Investment Corporation, Inc., Lafayette, CA
Potlatch Corporation, Larkspur, CA
Poulsen Land Company, Olympic Valley, CA
Principia, Lakewood, CO (on behalf of TCID)*
Pyramid Lake Paiute Tribal Newspaper, Nixon, NV
Pyramid Lake Water Resources, Wadsworth, NV
Rapid Creek Research, Boise, ID
Regional Water Planning Commission, Reno, NV
Reno-Sparks Association of Realtors, Reno, NV*
Reno-Sparks Chamber of Commerce, Sparks, NV*
Reno-Tahoe Airport Authority, Reno, NV
Resource Planning Analysis, Reno, NV
Resource Concepts, Inc., Carson City, NV
Rollston, Henderson, Rasmussen, and Crabb, South Lake Tahoe, CA
Ryder Homes of Nevada, Reno, NV*
SAIC, Sacramento, CA
Sierra Nevada College, Incline Village, NV
Somach, Simmons and Dunn, Sacramento, CA (on behalf of Heavenly Valley
Ski Resort)*
Squaw Creek Estates, Olympic Valley, CA
Squaw Valley Ski Resort, Olympic Valley, CA
Stantec, Reno, NV
State of Arizona, Department of Water Resources, Office of the Chief Counsel,
Phoenix, AZ
Stetson Engineers, Inc., San Rafael, CA
Systech Engineering, Inc., San Ramon, CA
Tahoe Donner Ski Resort, Truckee, CA
Tahoe Lakefront Owners Association, Tahoe City, CA
Tahoe Regional Planning Agency, Stateline,
Tahoe Truckee Flyfishers, Tahoe City, CA
Teichert Aggregate, Truckee, CA
Trimond Land Company, Truckee, CA
Truckee Donner Recreation and Park District, Truckee, CA
Truckee Falls GP, Rancho Cordova, CA
Truckee Meadows Community College, Sparks, NV

Entities and Organizations – continued

Truckee Meadows Regional Planning Agency, Reno, NV
Truckee River Basin Water Group, Truckee, CA*
Truckee River Fly Casters, Reno, NV
Truckee River Professional Tours, Reno, NV
Truckee River Watershed Council, Reno, NV
University of California, Berkeley; Soquel
University of Nevada, Las Vegas, Las Vegas
University of Nevada, Reno, Reno; Fallon
University of Southern California, Los Angeles
Water Education Foundation, Sacramento, CA
Water Research and Development, Reno, NV
Water System Management Company, Reno, NV
Western Environmental Law Center, Taos, NM
Western Water Alliance, Seattle, WA
Woodburn and Wedge, Reno, NV
Woodward Clyde Consultants, Sacramento, CA
WRC Environmental, Sacramento, CA

Power and Water Purveyors

Alpine Springs County Water District, Tahoe City, CA
Apple Valley Ranchos Water Company, Apple Valley, CA
Association of California Water Agencies, Sacramento, CA
Binder & Associates, Folsom, CA (on behalf of TCID)*
Calaveras County Water District, San Andreas, CA
Carson-Truckee Water Conservancy District, Fallon, NV
Donner Lake Water Company/Del Oro Water Company, Chico, CA
Lahontan Conservation District, Fallon, NV
McQuaid, Bedford and Van Zandt, LLP, San Francisco, CA (on behalf of TCID)*
Northstar Community Services District, Truckee, CA
 Northstar at Tahoe, Truckee, CA
 Northstar at Tahoe Golf Course, Truckee, CA
North Tahoe Public Utilities District, Tahoe Vista, CA
Placer County Water Agency, Auburn, CA*
Sacramento Municipal Utilities District, Sacramento, CA
Squaw Valley Public Service District, Olympic Valley, CA

Power and Water Purveyors – continued

Sierra Pacific Power Company, Reno, NV
Sierra Valley Water Company, Loyalton, CA; Plymouth, CA; Oraeagle, CA*
South Tahoe Public Utilities District, South Lake Tahoe, CA
Squaw Valley Public Service District, Olympic Valley, CA
Tahoe City Public Utilities District, Tahoe City, CA
Tahoe Swiss Village Utilities, Homewood, CA
Tahoe-Truckee Sanitation Agency, Truckee, CA
Truckee-Carson Irrigation District, Fallon, NV*
Truckee Donner Public Utility District, Truckee, CA
Truckee Meadows Water Authority, Reno, NV*
Truckee River Watershed Council, Truckee, CA
Washoe County Water Conservation District, Reno, NV

Environmental Groups

American Fisheries Society, Bethesda, MD
American Rivers, Nevada City, CA
American Water Resources Association, Middleburg, VA
California Natural Resources Group, Fresno, CA
California Trout, Stanford, CA
Center for Watershed and Environmental Sustainability, Reno, NV
Champions of the Truckee River, Reno, NV
Ducks Unlimited, Inc.
 Western Regional Office, Rancho Cordova, CA
Environmental Defense Fund
 National Headquarters, New York, NY
 California Regional Office, Oakland, CA
Friends of Nevada Wilderness, Reno, NV
Friends of Squaw Creek, Olympic Valley, CA
Great Basin Bird Observatory, Reno, NV
Lahontan Valley Environmental Alliance, Fallon, NV*
Lahontan Valley Wetlands Coalition, Reno, CA
League to Save Lake Tahoe, South Lake Tahoe, CA
National Audubon Society
 Lahontan Chapter, Reno, NV
 California State Office, Sacramento, CA
 New York, NY

Environmental Groups – continued

National Water Resources Association, Arlington, VA
National Wildlife Federation, Washington, DC
Natural Resources Defense Council, Inc., San Francisco, CA
Nevada Land Conservancy, Reno, NV
Nevada Waterfowl Association, Reno, NV
Pacific Fishery Management Council, Portland, OR
Restoration Group, Truckee, CA
Save the American River Association, Fair Oaks, CA
Sierra Club
 National Headquarters, San Francisco, CA
 Toiyabe Chapter, Reno, NV*
Sierra Watch, Nevada City, CA
The Fund for Animals, Inc., New York, NY
The Nature Conservancy,
 National Office, Arlington, VA
 Northern Nevada Office, Reno, NV
The Wildlife Society
 Western Section, Sacramento, CA
Trout Unlimited, Arlington, VA
Western Wetlands, Orem, UT

Individuals

Dick Acton, Reno, NV
Bruce Ajari, Tahoe City, CA
Richard Anderson, Truckee, CA*
Mahood Azad, Reno, NV
Bob Baiocchi, Graeagle, CA*
William Bettenberg, Middleton, WI
Ted Birr, Piedmont, CA
Loretta Bonta, Nixon, NV
Robert K. Brorsen, San Mateo, CA*
Robert Buehler, Zepheyr Cove, NV
Dan Cockrum, Truckee, CA
Ralph and Elmira Copeland, Fernley, NV
William Cowan, Reno, NV
Joe Dahl, Fallon, NV

Individuals – continued

Ed DePaoli, Fernley, NV
Daryl Drake, Reno, NV*
Francis E. DuBois III, Fallon, NV
Mary Jo Elpers, Reno, NV
Bruce Gescheider, Reno, NV*
John Guerrero, Wadsworth, NV
Chad Gourley, Farmington, UT
Ron Guerrero, Wadsworth, NV
Carl Gustafson, Olympic Valley, CA
Timothy Hackman, Stockton, CA
Rebecca Harold, Fernley, NV
Fred Haswell, Truckee, CA
Oliver Henderickson, Tahoe City, CA
Jolene Henry, Wadsworth, NV
Norman Hill, Citrus Heights, CA
John Hiscox, Nevada City, CA
Jack Hoffman, Reno, NV
Peter Jeffalone, Carnelian Bay, CA
Sonja Johnson, Fallon, NV
Adrian M. Juncosa, Truckee, CA
Brett Kandt, Reno, NV*
Brian Kempkes, Fairfield, CA
Peter A. Krenkel, Reno, NV
James Lauchland, Lodi, CA
Lee Light, Loyalton, CA
Roy Light, Loyalton, CA
Robie Litchfield, Truckee, CA
Susan Lynn, Reno, NV*
Sue and Stuart Mackie, Reno, NV
Stuart Mackie, Hazen, NV
Richard B. Madden, Larkspur, CA*
Bev and Roy Mapps, Incline Village, NV
Monte Martin, Fernley, NV
Joseph W. Mayer, Sparks, NV*
Bert McCoy, Fernley, NV
Daniel A. McDaniel, Stockton, CA
Mark McLaughlin, Carnelian Bay, CA

Individuals – continued

Denny McLeod, Piedmont, CA*
Jeri Mullins, Truckee, CA
Nancee Murray, Sacramento, CA
David Mutgin, Sutcliffe, CA
Barbara Osborn, Truckee, CA
Mark Palasits, San Francisco, CA
Robbin Palmer, Reno, NV
Al and Carla Pombo, Truckee, CA
Estella Poncho, Wadsworth, NV
Leo Poppoff, Pebble Beach, CA
Charles E. Porter, Truckee, CA
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Terry Randolph, Carson City, NV
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Note: Copies of court decrees, court cases, laws, and regulations cited in this final EIS/EIR can be acquired from the Bureau of Reclamation, Carson City, Nevada, or from the State of California, Department of Water Resources, Sacramento, California. For further information, contact:

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GLOSSARY

A

accumulate: To create a water category in a reservoir or to increase its storage.

acre-foot: Volume of water (325,853.382 U.S. gallons) that would cover 1 acre to a depth of 1 foot.

active conservation storage: Water storage for later release for uses such as municipal and industrial (M&I), hydropower, or irrigation.

Additional California Environmental Credit Water: A water category under TROA used for non-consumptive, stream, and riparian environmental purposes.

affected environment: Existing biological, physical, social, and economic conditions of an area subject to change, both directly and indirectly, as the result of a proposed human action; also, the chapter in an environmental impact statement describing current environmental conditions.

air quality: Measure of the health-related and visual characteristics of the air, often derived from quantitative measurements of the concentrations of specific injurious or contaminating substances.

algae: Mostly aquatic single celled, colonial, or multi-celled plants, containing chlorophyll and lacking stems, roots, and leaves.

algal bloom: Rapid and flourishing growth of algae; often a heavy growth of algae in and on a body of water as a result of high nutrient concentration.

all reservoirs: For this document, the five Federal reservoirs (Lake Tahoe, Prosser Creek Reservoir, Stampede Reservoir, Boca Reservoir, and Martis Creek Reservoir) and the two non-Federal reservoirs (Donner Lake and Independence Lake) in the Truckee River/Lake Tahoe system. (Note: This term is not used in the Draft Agreement or Negotiated Agreement.)

Alpine court: The U.S. District Court that supervises and administers the *Alpine* decree.

alternatives: Courses of action, which may meet the objectives of a proposal at varying levels of accomplishment, and include “no action,” the most likely future conditions without the project or action.

amphibian: A type of vertebrate animal that has a life stage in water and a life stage on land (e.g., salamanders, frogs, and toads).

anchor ice: Ice forming below the surface of a stream, on the streambed, or upon a submerged body or structure.

anoxia: Absence of oxygen.

aquatic: Living or growing in or on the water.

aquifer: Stratum or zone below the surface of the earth containing water.

archaic: In American archeology, a cultural stage following the earliest known human occupation in the New World (about 5,500 B.C. to A.D. 100), characterized by a hunting and gathering lifestyle and seasonal movement to take advantage of a variety of resources.

archeology: Study of human cultures through the recovery and analysis of their material relics.

artifact: A human-made object.

avian: Of, or having to do with, birds.

B

benthic: Bottom of water bodies with particular reference to organisms.

biomass: Total mass or amount of living organisms in a particular area or environment.

biota: Plant and animal life of a region.

bypass (water): Water that is not diverted at a structure and is allowed to continue to flow downstream.

C

California Environmental Credit Water: A water category under TROA, used for non-consumptive, stream and riparian environmental purposes.

California M&I Credit Water: A water category under TROA, used for M&I and groundwater injection for recharge of aquifers in the Truckee River basin in California.

- California Species of Special Concern:** Species in California which are not Federal- or State-listed as endangered, threatened, or rare, but are declining or so few in number that extirpation is a possibility.
- candidate species:** Plant or animal species that are not listed but which are undergoing a status review as published in the Federal Register by the U.S. Fish and Wildlife Service as candidates for possible addition to the list of threatened and endangered species.
- canid:** An animal belonging to the family Canidae, such as coyotes and foxes.
- canopy:** The more or less continuous cover of branches and foliage formed collectively by the crowns of adjacent trees and shrubs.
- carnivore:** An animal that kills and eats other animals.
- cavity excavator:** A species that digs or chips out cavities in wood for nesting, roosting, or foraging.
- cavity nesters:** Animals that nest in cavities.
- channelization:** Straightening a stream or river so that water travels through the area more quickly.
- colonial nesting:** Birds (from different species) that nest in close proximity.
- colonization:** The occupation of a new habitat by a species.
- community:** A group of interacting populations of plants and animals in a common spatial arrangement at a particular point in time.
- concentration:** The relative amount of a substance in a solution.
- conservation pool:** A residual pool maintained in a reservoir to support fish and other aquatic life.
- critical drought period:** For this document, a hydrologic period during which the available water supplies from the Truckee River are equal to or less than those which existed from 1928 to 1935.
- crown cover:** The amount of canopy provided in a plant community.
- cubic foot per second (cfs):** As a rate of flow, a cubic foot of water passing a reference section in 1 second of time.

cultural resource: Any building, site, district, structure, or object significant in history, architecture, archeology, culture, or science.

current conditions: For this document, the existing environmental setting.

cuttings (plants): A piece cut from a plant, such as root or stem, and used for propagation.

D

dabbling ducks: Species of ducks, such as mallard, green-winged teal, gadwall, northern pintail, and American wigeon, that use shallow water areas and feed by tipping tail-up to reach aquatic plants, seeds, or invertebrates.

dead and inactive storage: A category of water in the bottom of Prosser Creek Reservoir and Stampede Reservoir in the amounts of 1,200 acre-feet and 4,600 acre-feet, respectively, which either cannot or will not be withdrawn.

deciduous: Perennial plants, trees, and shrubs that shed their leaves at some time of the year, particularly in the fall.

decomposition: Degradation of organic matter.

delta: A formation created by sediment deposition and/or channel incision at a river mouth from upstream erosion. The delta formed at Pyramid Lake is a result of channel incision.

deposition: The process by which sediments are laid down through the actions of wind, water, ice, or other natural occurrences.

desiccate: To dry up; remove moisture from a substance.

desiccation: The process of drying.

discharge: All water that passes a specific location, expressed in acre-feet per year; relative to a lake or reservoir, discharge includes all water that passes through the outlet facilities, passes over the spillway, is pumped from the reservoir, or seeps through the dam or foundation into the stream downstream from the lake or reservoir.

displacement: To the extent that two or more categories of water cannot be simultaneously stored in the same reservoir, an operation whereby a water category of higher storage priority causes one of lower storage priority to be exchanged, released, or spilled.

dissolved inorganic nitrogen: Nitrogen primarily in the form of nitrite, nitrate, or ammonia.

dissolved oxygen (DO): Amount of free oxygen in water.

diversion: A structure in a river or canal that diverts water from the river or canal to another watercourse.

Draft Agreement: For the purposes of the revised DEIS/EIR, the draft Truckee River Operating Agreement was referred to as the Draft Agreement.

draw down: Lowering a reservoir's water level; process of releasing reservoir storage.

drought period: See critical drought period.

drought situation: When the April 15 runoff forecast for the Truckee River indicates there would not be sufficient unregulated water and Floriston Rate Water to maintain Floriston Rates through the water year or if the elevation of Floriston Rate Water in Lake Tahoe is forecast to drop below 6223.5 feet Lake Tahoe datum before November 15. See critical drought period.

dry water year: A dry water year would exist when the April 15 forecast for the Truckee River indicates there would not be sufficient uncontrolled runoff and Floriston Rate Water storage to maintain Floriston Rates through the water year.

E

ecosystem: Complex system composed of a community of animals and plants as well as the chemical and physical environment.

effluent: A discharge of waste, such as treated sewage.

emergent vegetation: Aquatic plants with most vegetative parts growing above water.

endangered species: In accordance with the federal Endangered Species Act of 1973, as amended, any species in danger of extinction throughout all or a significant portion of its range.

entrainment: To be moved by water motion involuntarily.

ephemeral: Streams or ponds that contain water only for brief periods of time in direct response to precipitation.

epilimnion: The upper layer of a stratified lake (see stratification).

erosion: Refers to soil and the wearing away of the land surface by water, wind, ice, or other physical processes.

eutrophication: Enrichment of a lake or other water body with nutrients, resulting in excessive growth of organisms and depletion of oxygen.

evaporation: Loss of moisture as water vapor.

evapotranspiration: Moisture returned to the air through direct evaporation or transpiration of vegetation.

exotic species: A non-native species that is introduced into an area.

extirpated: A species of plant or animal that is no longer found in a particular area.

F

facilities: Manmade structures, such as dams, canals, spillways, outlet works, and fishways.

facultative: Not required or compulsory for an organism to grow.

fawning: The process of a deer giving birth.

Federal reservoirs: See Truckee River reservoirs.

Fernley Municipal Credit Water: A water category under TROA, used for M&I, local aquifer injection well recharge, re-vegetation of former agricultural lands, local wetlands water quality improvement, or Pyramid Lake fish flow enhancement.

fingerling: A young or small fish.

Fish Credit Water: A water category under TROA, used to benefit cui-ui in lower Truckee River/Pyramid Lake and LCT in the Truckee River basin.

Fish Water: A water category under TROA, comprised of Stampede Project Water and Prosser Project Water.

flood control pool: That portion of reservoir storage space reserved during certain times of the year to capture and temporarily hold flood flows:

Floriston rates: Required rates of flow in the Truckee River, measured at the U.S. Geological Survey stream gauging station at Farad, California, which vary from 300 cfs to 500 cfs, depending on the water elevation of Lake Tahoe and the time of year.

Floriston Rate Water: Project Water stored in Lake Tahoe and Boca Reservoir pursuant to the *Orr Ditch* decree, water exchanged under the Tahoe-Prosser Exchange Agreement (TPEA), and unregulated flow in the Truckee River are used to achieve Floriston Rates.

flushing of fish: Downstream movement of fish because of high water velocity.

Forest Service Sensitive and Watch List Species: A U.S. Forest Service term to indicate plant species of limited distribution.

fry: Life stage of fish between egg and fingerling.

G

gauging station: Specific location on a stream where systematic observations of hydrologic data are obtained through mechanical or electrical means. (“Gauge,” “gaging station,” and “gage” are variations.)

germination: the development of a seed into a seedling.

groundwater: Water beneath the ground, consisting mostly of surface water that has seeped down.

H

habitat: Area where a plant or animal lives.

harvest (fishery): In a recreational fishery, refers to numbers of fish that are caught and kept.

head cutting: A natural process of active erosion in a water channel caused by an abnormal and abrupt change in channel gradient, which causes a “waterfall” action, which erodes the channel by undercutting the substrate material and causing the collapse of the upper level (head; this “undercut-collapse” process advances up the channel until bedrock is reached.

herbaceous: Refers to vegetation growing close to the ground that does not develop persistent woody tissue, usually lasting for a single growing season.

hydroelectric powerplant: Structure that houses turbines, generators, and associated control equipment, which uses the flow of water to generate electricity.

hydrologic: Pertaining to the quantity, quality, and timing of water.

hydrophytic: A plant that grows in association with standing water or saturated soil (e.g., cattails, bulrushes, sedges, and rushes).

hypolimnetic: Refers to the cold bottom water zone below the thermocline in a lake.

hypolimnion: The lower layer of a stratified lake. (See stratification.)

I

inactive storage: Lake or reservoir storage not available for release without pumping.

incubation: Eggs in the process of hatching.

indicator: A physical, chemical, or biological parameter that is selected to represent characteristics of a broader resource category, particularly for the purpose of evaluating impacts (e.g., a trout species as representative of all game fish species in an area).

indigenous: Native plant or animal species.

in situ: In the site of.

insectivorous: Feeding on insects.

inundate: To cover with water.

invertebrate: An animal lacking a spinal column.

J

Joint Program Fish Credit Water: A water category under TROA. Joint Program Fish Credit Water is a portion of Fish Credit Water managed by California to enhance streamflows in California and recreational pools in all reservoirs.

juvenile: Young animal that has not reached reproductive age.

K

kilowatt (kW): Unit of electric power (capacity) equal to 1,000 watts, or about 1.34 horsepower.

kilowatthour (kWh): Basic unit of electric energy equal to an average of 1 kilowatt of power applied over 1 hour.

L

lacustrine: Of or pertaining to a lake.

lake: A relatively large natural body of standing water.

Lake Tahoe basin: The land area that drains naturally into Lake Tahoe.

Lake Tahoe datum: The elevation reference point at Lake Tahoe Dam for measuring the elevation of Lake Tahoe, assumed to be at an elevation of 6223.00 feet mean sea level.

land bridge: A continuous land connection between two land masses.

larva: The newly hatched, earliest stage of animal that undergoes metamorphosis, differing markedly in form and appearance from the adult.

leaf senescence: Aging of a leaf.

life cycles (aquatic life): The stages through which an organism passes between reproduction by one generation and reproduction by the next.

life history: Life cycles through which organisms pass, with emphasis on reproduction and survival mechanisms.

littoral zone: Pertains to the shallow water area along the edge of a body of water.

loading: The process of adding a substance (such as dissolved nitrogen) to something (such as a body of water).

lower Truckee River: That reach of the Truckee River downstream from Derby Diversion Dam to Pyramid Lake.

M

M&I: Municipal and industrial.

macroinvertebrate: Invertebrate that can be seen by the unaided eye.

mandatory signatory: Each of the five parties required to sign TROA for it to become effective—U.S. Department of the Interior, California, Nevada, Truckee Meadows Water Authority (formerly Sierra Pacific Power Company), and Pyramid Lake Paiute Tribe of Indians

mechanical aeration: Using mechanical means (aerators) to increase dissolved oxygen in bodies of water.

mitigation (measures): Action taken to avoid, reduce the severity of, or eliminate an adverse impact.

minimum supply year: As used in this EIS/EIR, the minimum supply year (or minimum annual supply) is the calendar year with the least supply to serve water rights over the 100-year period of analysis.

Modoc-Great Basin cottonwood-willow riparian forest: An open canopied, broadleafed, deciduous riparian forest dominated by Fremont cottonwood and willows.

Modoc-Great Basin riparian scrub: An open to dense, broadleafed, deciduous shrubby thicket dominated by willow species.

montane black cottonwood riparian forest: A fairly dense, mixed riparian forest dominated by black cottonwood.

montane freshwater marsh: A freshwater marsh found in high elevations with a short growing season due to cold winters.

montane riparian scrub: An open to dense, broadleafed, deciduous shrubby riparian thicket dominated by willow, alder, or dogwood species.

movement corridor: A linear area of primarily continuous vegetation, such as along streamcourses, which provides an avenue for wildlife to disperse from one habitat or geographical area to another, or for seasonal movements between high and low elevations.

N

National Register of Historic Places: A federally maintained register of districts, sites, buildings, structures, architecture, archeology, and culture.

Negotiated Agreement: The TROA document negotiated by the mandatory signatories and others that is the basis for this final EIS/EIR. For the purposes of this final EIS/EIR, TROA refers to both the Negotiated Agreement and proposed action.

Newlands Project Credit Storage: Water temporarily stored in Stampede Reservoir in accordance with the terms of Operating Criteria and Procedures (OCAP) for the Newlands Project (43 CFR 418.20)

Newlands Project Credit Water: A water category under TROA that replaces the term Newlands Project Credit Storage.

nitrogen-fixing: Refers to microorganisms that reduce gaseous nitrogen to ammonia or other compounds.

No Action Alternative: The most likely future conditions without the project or action.

non-Federal reservoirs: Donner and Independence Lakes.

normal water year: A water year when the April 15 runoff forecast for the Truckee River indicates there would be sufficient uncontrolled runoff and Floriston Rate Water storage to maintain Floriston Rates through the water year.

O

Orr Ditch court: The U.S. District Court that supervises and administers the *Orr Ditch* decree.

Other Credit Water: A water category under TROA that is a place holder for categories of credit water not yet identified but which may be proposed after TROA is implemented.

outmigration: The movement of a group of organisms out of an area.

overgrazing: Excessive grazing use of area by livestock, resulting in detrimental impacts to the environment.

overstory: The portion of the trees or shrubs that form the uppermost portion of the canopy layer.

oxbow: A bow-shaped bend in the river, or a bow-shaped lake formed in an abandoned channel of a river.

P

palustrine emergent wetlands: Wetlands dominated by erect, rooted herbaceous hydrophytes, excluding moss and lichens.

palustrine forested wetlands: Wetlands dominated by woody vegetation greater than 20 feet tall.

palustrine scrub/shrub wetlands: Wetlands dominated by woody vegetation less than 20 feet tall.

perennial: Refers to plants that have a life cycle that lasts for more than 2 years.

periphyton: Algae found on rocks and other bottom substrates.

permeable: Having pores or openings that permit liquids or gases to pass, capable of being permeated.

permeate: To diffuse through or penetrate something.

phytoplankton: Algae found in the water column.

planimetry: The measuring of a mapped area.

pond-like area: In this document, refers to cut-off meanders (oxbows) and low-lying areas in the flood plain.

population viability: Probability that a population will persist for a specified period across its range despite normal fluctuations in population and environmental conditions.

precipitation: Liquid or solid water particles that fall from the atmosphere and reach the Earth's surface, such as drizzle, rain, snow, snow pellets, snow grains, ice crystals, ice pellets, and hail.

predation: The consumption of one organism (the prey) by another (predator).

primary wetlands: Wetlands (see definition of wetlands) located within Stillwater National Wildlife Refuge, Stillwater Wildlife Management Area, Carson Lake and Pasture, and Fallon Indian Reservation (i.e., the Lahontan Valley wetlands designated by P.L. 101-618).

Private Water: Water stored by TMWA in Independence Lake and Donner Lake, and by TCID in Donner Lake.

Project Water: Water stored in Lake Tahoe, Prosser Creek Reservoir, Stampede Reservoir, and Boca Reservoir pursuant to existing storage licenses or permits (e.g., Stampede Project Water).

Project Water in Another Reservoir: A water category under TROA, which has the same use as the initial Project Water.

Prosser Project Water: Project Water stored in Prosser Creek Reservoir pursuant to the existing U.S. storage permit with SWRCB, exchanged under TPEA, released to benefit of Pyramid Lake fishes and to maintain minimum reservoir releases

protective armoring (in relation to streambeds): Natural roughening of a streambed surface by erosion, which protects the fine, erodible materials below.

public involvement: Process of obtaining citizen input into development of planning documents, required in any EIS.

Pyramid Lake fishes: Federally endangered cui-ui and threatened LCT.

Pyramid Tribe Appropriated Water: Water in the Truckee River not subject to vested and perfected rights as of 1984, that was appropriated by the Pyramid Tribe pursuant to Nevada State Engineer Ruling No. 4683.

R

raptor: Any predatory bird that has feet with sharp talons or claws and a hooked beak, such as a falcon, eagle, hawk, or owl.

reach: Any specified length of a stream, river, channel, or other water conveyance.

recruitment: Survival of young plants and animals from birth to a life stage less vulnerable to environmental change.

relative abundance: The density or number of individuals of a particular species relative to other species in an area.

release: The portion of the discharge from a lake or reservoir that supplies identified demands (for diversions, storage, instream flow, flood control) , expressed in cfs.

reptile: Coldblooded vertebrate of the class Reptilia, comprised of turtles, snakes, lizards, and crocodiles.

representative years: For this EIS/EIR, representative years (1986—wet; 1989—median; and 1992—dry) were chosen based on recent operations rather than a long-term record.

reservoir: The storage created by a dam in a natural lake, such as Lake Tahoe, or an artificial lake, including the dam, spillway, and other associated facilities, such as Stampede Reservoir.

resident: A wildlife species commonly found in an area during a particular time; summer, winter, or year round.

riparian: Of, on, or pertaining to the bank of a river, pond, or lake.

riparian corridor: River and streams with their associated vegetation.

riverine: Pertaining to a river.

river stage: River surface elevation at a specified flow.

rodent: Small mammals with large incisors, such as mice, squirrels, and beavers.

roost site: Place where a bat or bird will rest during the day or night, typically protected from weather and predators.

run-of-the-river: River flow in a reach unregulated by hydraulic control or storage structures.

runoff: The surface flow of precipitation on a land area that discharges to a stream, channel or other water collection structure.

S

saline: Water that has measurable salt concentration.

salinity: A measure of the quantity of the total dissolved solids in water.

salmonid: Fish belonging to the family Salmonidae, including salmon, trout, and whitefish.

saplings: Young trees generally between 1 to 4 inches in diameter at breast height.

scour: Water forces removing debris and sediments from a channel.

sediment: Unconsolidated solid material that comes from weathering of rock and is carried by, suspended in, or deposited by water or wind.

self-sustaining: A population of organisms that is maintained by natural means.

Settlement Act: Title II of P.L. 101-618, Truckee-Carson-Pyramid Lake Water Rights Settlement Act of 1990.

shorebirds: Birds that forage along the edge of lakes, reservoirs, wetlands, and rivers, such as sandpipers, plovers, and killdeer.

shore zone: The land bordering a body of water.

shrubs: Plants with woody stems, generally less than 20 feet tall, such as willows.

significance: CEQ Guidance, 43 CFR section 1508.27, explains that significance requires considerations of the context of the action (society as a whole, the affected region, affected interests, and locality) and intensity (the severity of impact).

site: In archeology, any location of past human activity.

slough: An inlet or backwater swamp, bog, or marsh.

snag: A standing dead tree.

songbird: Small to medium-sized birds that perch and vocalize or “sing,” primarily during the breeding season.

spawn: To lay eggs, especially in reference to fish.

spawning flows: Streamflow necessary for fish spawning; equivalent to riverine fish habitat.

spawning run: The migration of a group of fish for the purpose of spawning.

special status species: For this EIS/EIR, those FWS Species of Concern, California Species of Special Concern, Region 1 Fish and Wildlife Service Species of Management Concern, and Forest Service Sensitive and Watch List Species that may occur within the study area.

species: In taxonomy, a subdivision of a genus that (1) has a high degree of similarity among individuals, (2) is capable of interbreeding only in the species, and (3) shows persistent differences from members of allied species.

species richness: The number of different species in an area.

spill: Any discharge from a lake or reservoir that is not a release.

stock: See strain.

Stampede Project Water: Project Water stored in Stampede Reservoir pursuant to the existing U.S. storage permit with SWRCB and released to benefit Pyramid Lake fishes and to maintain minimum reservoir releases.

strain: A genetically distinct group of fish maintained as a self-sustaining, interbreeding population with definable characteristics, through either artificial or natural production (also called stock).

stranding: The isolation of an organism from its habitat, generally caused by an event such as high flows which then decline, intermittent streamflows, or changes in habitat.

stratification: The formation of separate water layers in a lake or reservoir. In thermal stratification, cold water, which is denser than warm water, sinks, forming a layer at the bottom. In density or salinity stratification, saline water that is denser than fresh water, sinks, forming a layer at the bottom.

streamflow: Water flowing within the bounds of a channel (mostly natural channels). also known generally as “flow.”

submergent vegetation: Plants that grow completely under the water except when flowering.

substrate: Surface on which a plant or animal grows or is attached.

sucker (fish): A freshwater fish belonging to the family Catostomidae, such as cui-ui or Tahoe sucker.

suspension: State in which particles are mixed with a fluid but are not dissolved, or a system made up of small particles kept dispersed by agitation.

T

Tahoe-Prosser Exchange Water: Project Water stored in Prosser Creek Reservoir pursuant to the existing United States storage license with SWRCB and released pursuant to TPEA to make up for Floriston Rate Water previously released to maintain minimum releases from Lake Tahoe.

TCID Private Water: Private Water stored pursuant to the water rights of TCID in Donner Lake for the benefit of TCID.

terminus: The end point of a stream or river, e.g., Pyramid Lake is the terminus of the Truckee River.

terrestrial: Growing or living on land.

thermal stratification: Lake or reservoir waters of different temperature have different density that become partitioned in the water column seasonally.

thermocline: Boundary layer in a thermally stratified lake in which the temperature changes sharply with depth.

threatened species: In accordance with the federal Endangered Species Act of 1973, as amended, any species likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

- threshold of significance:** A quantitative or qualitative standard, or set of criteria, pursuant to which the significance of a given environmental effect may be determined.
- TMWA Emergency Credit Water:** A water category under TROA used for M&I purposes in TMWA's service area during a drought or emergency.
- TMWA Interim Storage:** Private Water stored in Stampede and Boca Reservoirs in accordance with the Interim Storage Agreement
- TMWA M&I Credit Water (Firm and Non-Firm):** A water category under TROA used for M&I purposes in TMWA's service area during a drought or emergency.
- TMWA Private Water:** Private Water stored pursuant to the water rights of TMWA in Independence Lake and Donner Lake for M&I use in TMW's service area (generally Truckee Meadows).
- tolerance limits:** The upper or lower level of an environmental condition between which an organism is able to survive.
- topographic:** Measuring and displaying on maps of physical surface features such as rivers, mountains, or roads.
- total dissolved solids (TDS):** The total concentration of solids (or salts) dissolved in water.
- total storage:** The volume of a reservoir up to the maximum controllable storage, including dead storage.
- traditional cultural property:** A site or resource that is eligible for inclusion in the National Register of Historic Places because of its association with cultural practices or beliefs of a living community.
- transmontane freshwater marsh:** Freshwater marsh found in low to mild elevations, subject to low temperatures in the winter, often found adjacent to rivers.
- tributary:** River or stream flowing into a larger river or stream.
- TROA:** For the purposes of this final EIS/EIR, TROA refers to both the Negotiated Agreement and the proposed action.

Truckee River basin: Hydrologically and for the purpose of defining the study area, the land area that drains naturally to the Truckee River and its tributaries, and into and including Lake Tahoe (Lake Tahoe basin) and Pyramid Lake; administratively and for the purpose of analysis in this document, the land area that drains naturally to the Truckee River and its tributaries and into Pyramid Lake, but excluding the Lake Tahoe basin.

Truckee River General Electric court: The U.S. District Court that supervises and administers the *Truckee River General Electric* decree.

Truckee River reservoirs: As defined in P.L. 101-618, “the storage provided by the dam at the outlet of Lake Tahoe, Boca Reservoir, Prosser Creek Reservoir, Martis Creek Reservoir, and Stampede Reservoir.” Also called Federal reservoirs.

Truckee River system: Includes the Truckee River, all tributaries to the Truckee River, and all reservoirs and lakes associated with the Truckee River, sometimes used interchangeably with “Truckee River basin.”

turbidity: Cloudiness of water, measured by how deeply light can penetrate into the water from the surface.

U

undercutting: A process in which a stream, through degradation, cuts its channel into the bed of the valley. Also a bank that has had its base cut away by water and overhangs part of the stream.

unregulated flow: For this document, unregulated flow in a stream means all water that: is runoff downstream from a reservoir; was passed through a reservoir without being stored; was released from a reservoir after being temporarily stored for the purpose of flood control; or was discharged from a tributary without a reservoir.

upper Truckee River basin: For this document, the upper Truckee River Basin is defined as the Truckee River basin in California.

usable storage: The storage normally available between the maximum controllable level and dead storage.

V

vertebrate: An animal having a segmented backbone or vertebral column. Includes mammals, birds, fish, amphibians, and reptiles.

vigor: Refers to plants with healthy growth.

W

water category: a type of water use or storage discussed in the Negotiated Agreement and this document. .

water bird: Any swimming or wading bird, such as loons, pelicans, cormorants, herons, or egrets.

water demand: Refers to requirements for delivery of water, such as M&I, irrigation, hydropower generation, and streamflow.

waterfowl: Swans, geese, and ducks, collectively.

water operations: The management of categories of water stored in a reservoir or flowing in a river to meet specific objectives (such as serve water rights, achieve streamflows), including such techniques as accumulating water in storage, exchanging water categories, and releasing water from storage.

Water Quality Credit Water: Water associated with water rights acquired under the Truckee River Water Quality Settlement Agreement.

Water Quality Water: Water associated with water rights acquired under the Truckee River Water Quality Settlement Agreement.

water table: The depth below which the ground is saturated with water.

water year: The 12-month period beginning October 1 of one year and ending September 30 of the following year and designated by the calendar year in which it ends.

wetland habitat: Habitat provided by standing water (less than 6-feet deep) with or without emergent and aquatic vegetation in wetlands.

wetlands: Lands transitional between aquatic and terrestrial systems where the water table is usually at or near the land surface or the land is covered by shallow water.

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