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Glossary Appendix

Shasta Lake Water Resources Investigation, California

Prepared by:

**United States Department of the Interior
Bureau of Reclamation
Mid-Pacific Region**



Glossary

The definitions in this glossary include technical and regulatory terms used in the Shasta Lake Water Resources Investigation (SLWRI) Draft Feasibility Report and Preliminary Draft Environmental Impact Statement (PDEIS). Some of the definitions of terms were specifically developed for the SLWRI and are not the same as definitions used for other programs in other places.

Term	Definition
A-weighted decibel (dBA)	An overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear.
acceptability	One of four criteria in the Principles and Guidelines (P&G) that must be considered in the formulation of each alternative plan under consideration. The other three criteria are Completeness, Effectiveness, and Efficiency. Acceptability is the workability and viability of the alternative plan with respect to acceptance by State and local entities and the public and compatibility with existing laws, regulations, and public policies.
acre-foot (AF)	The volume of water that would cover 1 acre to a depth of 1 foot, or 325,851 gallons of water. A flow of 1 cubic foot per second (cfs) for 1 day is approximately 2 acre-feet.
affect/effect	To affect (a verb) is to bring about a change. An effect (usually a noun) is the result of an action.
affected environment	Existing biological, physical, social, and economic conditions of an area subject to change, both directly and indirectly, as a result of a proposed human action.
afterbay	A pool of water at the base of a dam; specifically, water after it has passed through a turbine.
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.
alevin	The life stage of a salmon between hatching from the egg and emergence from the stream gravels as a fry. Alevins are characterized by the presence of a yolk sac, which provides nutrition while the alevin develops in the redd.
alternatives	Courses of action that may meet the objectives of a proposed action at varying levels, including the most likely future without the project or action. An Environmental Assessment or an Environmental Impact Statement (EIS) identifies and objectively evaluates and analyzes all reasonable alternatives, including a no-action alternative.
alluvium	Soil particles transported and deposited by water.
Ambient Air Quality Standards (AAQS)	The U.S. Environmental Protection Agency sets National Ambient Air Quality Standards (AAQS), as required by the Clean Air Act as amended in 1990, for pollutants considered harmful to public health or the environment. AAQS are in place for six pollutants: carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, and sulfur dioxide.
anadromous fish	Fish such as salmon or steelhead trout that hatch in fresh water, migrate to and mature in the ocean, and return to fresh water as adults to spawn.

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Term	Definition
Anadromous Fish Restoration Program (AFRP)	A program authorized by the Central Valley Project Improvement Act (CVPIA) to address anadromous fish resource issues in Central Valley streams that are tributary to the Sacramento-San Joaquin Delta (Delta). This program is led by the U.S. Fish and Wildlife Service (USFWS).
annual cost	The equivalent uniform yearly cost to repay a project over a given repayment period at a given interest rate.
Anthropogenic	Human-created.
apparent velocity	The horizontal vector of interstitial flow that is a function of permeability and hydraulic gradient. It is the general direction of flows between sediment particles on a river bed, as experienced by salmon redds.
applied water (AW)	The quantity of water delivered to the intake of a city's water system or a farm headgate. The quantity of water supplied to a marsh or other wetland, either directly or by incidental drainage flows.
appropriative water rights	Water rights based on the principle of prior appropriations, or "first in time, first in right."
aquatic	Living or growing in or on the water.
aquifer	An underground geologic formation of permeable rock that stores, transmits, and yields significant quantities of groundwater to wells and springs.
artificial propagation/production	As defined in Section 3403(b) of the CVPIA, "spawning, incubating, hatching, and rearing fish in a hatchery or other facility constructed for fish production."
Authorization	An act by the Congress of the United States that authorizes use of public funds to carry out a prescribed action.
baseload	Most commonly referred to as baseload demand, this is the minimum amount of power that a utility or distribution company must make available to its customers, or the amount of power required to meet minimum demands based on reasonable expectations of customer requirements. Baseload values typically vary from hour to hour in most commercial and industrial areas.
Basin Plan	State of California Central Valley Regional Water Quality Control Board Water Quality Control Plan for the Sacramento and San Joaquin river basins
Bay-Delta	See San Francisco Bay/Sacramento-San Joaquin River Delta.
Bay-Delta Standards	Standards set forth by the California State Water Resources Control Board, under the Bay-Delta Plan Accord, to balance and protect all beneficial uses of Delta water, including fishery and other instream uses, and to modify existing water rights, if necessary, to achieve that balance.
Bay/Delta Study	The Delta Outflow/San Francisco Bay Study, conducted by the California Department of Fish and Game (DFG), to determine the effects of freshwater outflow on the abundance and distribution of fish, caridean shrimp, and Cancer crabs in San Francisco Bay/Estuary.
Bay-Delta Plan Accord	In December 1994, representatives of the federal and State governments and urban, agricultural, and environmental interests agreed to the implementation of a Delta protection plan through the California State Water Resources Control Board, to provide ecosystem protection for the Bay-Delta Estuary. The Draft Bay-Delta Water Control Plan, released in May 1995, superseded California State water Resources Control Board Water Right Decision 1485.

Term	Definition
beneficial use	Actual or reasonable potential use that may be made of waters of the State, including but not limited to domestic, municipal, agricultural, and industrial.
benthic	Bottom of rivers, lakes, or oceans; organisms that live on the bottom of water bodies.
berm	A sloped wall or embankment (typically constructed of earth, hay bales, or timber framing) used to prevent inflow or outflow of material.
best management practice (BMP)	A policy, program, practice, rule, regulation, or ordinance for the use of devices, equipment, or facilities that is an established and generally accepted practice resulting in more efficient use or conservation of water, or a practice that has been given to indicate that significant conservation benefits can be achieved.
bioaccumulation	The process by which chemicals or elements present in the environment become more and more highly concentrated in organisms that feed on plants or lower organisms that originally accumulate those chemicals or elements from the environment.
biodiversity	The variety of life and its processes, including the variety of living organisms, the genetic differences among them, and the communities and ecosystems in which they occur.
Biological Assessment (BA)	A document prepared for the Section 7 process under the federal Endangered Species Act of 1993 (ESA), as amended, to determine whether a proposed major construction activity under the authority of a federal action agency is likely to adversely affect listed species, proposed species, or designated critical habitat.
Biological Opinion (BO)	Document issued under the authority of the federal ESA stating the USFWS and/or the National Marine Fisheries Service (NMFS) finding as to whether a federal action is likely to jeopardize the continued existence of a threatened or endangered species or result in the destruction or adverse modification of critical habitat.
CALFED Bay-Delta Program (CALFED)	A collaboration among 25 State and federal agencies that came together with a mission to develop and implement a long-term comprehensive plan that will restore ecological health and improve water management for beneficial uses of the Bay-Delta system.
CALFED Final Programmatic EIS/EIR	The National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) compliance document that provides a broad overview of the CALFED Program and the CALFED agencies' vision of their highest priority actions to pursue. It describes, in a broad sense, the environmental consequences of proposed actions and enables decisions to be made regarding CALFED Program direction and content.
CALFED Programmatic Record of Decision (ROD)	The record of decision issued by the federal lead agency for adopting the CALFED project as described in the CALFED Programmatic Final EIS/EIR and associated actions.
California Bay-Delta Authority	The entity that oversees the implementation of the CALFED Bay-Delta Program for the 25 State and federal agencies working cooperatively to improve the quality and reliability of California's water supplies while restoring the Bay-Delta ecosystem. The California Bay-Delta Act of 2003 established the Authority as the new governance structure and charged it with providing accountability, ensuring balanced implementation, tracking and assessing program progress, using sound science, assuring public involvement and outreach, and coordinating and integrating related government programs.

Term	Definition
California Endangered Species Act (CESA)	California legislation that prohibits the “take” of plant and animal species designated by the California Fish and Game Commission as either endangered or threatened. Take includes hunting, pursuing, catching, capturing, killing, or attempting such activity. CESA provides the DFG with administrative responsibilities over the plant and wildlife species listed under the act as threatened or endangered. CESA also provides the DFG with the authority to permit the take of State-listed species under certain circumstances. See Fish and Game Code 2050–2116.
California Environmental Quality Act (CEQA)	California legislation that requires State, regional, and local agencies to prepare environmental impact assessments of proposed projects with potentially significant environmental effects and to circulate these documents to other agencies and the public for comment before making decisions. CEQA requires the lead agency to make findings for all significant impacts identified in an Environmental Impact Report (EIR). The lead agency must adopt all mitigation to reduce environmental impacts to a less-than-significant level, unless the mitigation is infeasible or unavailable and there are overriding considerations that require the project to be approved. See Public Res. Code 21001.1, 21002, 21080; Guidelines 15002(c).
CalSim model	A planning model designed to simulate the operations of the Central Valley Project (CVP) and State Water Project (SWP) reservoir and water delivery system under current and future conditions. CalSim predicts how reservoir storage and river flows would be affected based on changes in system operations. CalSim output is typically used to help assess impacts on water supply, water quality, aquatic resources, and recreation.
CalSim-II model	The agreed-upon CVP/SWP implementation of the CalSim model code.
Candidate Conservation Agreement (CCA)	A voluntary agreement between the USFWS or NMFS and other federal or non-federal landowners that identifies specific conservation measures that the participants of the agreement will undertake to conserve species covered by the agreement, none of which are listed under the federal ESA, with the intention of preventing any need to list the species.
Candidate Conservation Agreement with Assurances (CCAA)	A voluntary agreement between the USFWS and a non-federal property owner who agrees to manage lands or waters to remove threats to candidate or proposed species, with assurances that the property owner’s conservation efforts will not result in future regulatory obligations that exceed those agreed to at the time the agreement is signed; it authorizes take if the species is later listed.
candidate species	Any species undergoing status review by the U.S. Secretary of the Interior or U.S. Secretary of Commerce for listing as an endangered or a threatened species but not yet the subject of a proposed rule (see 50 Code of Federal Regulations (CFR) 424.02), or any species accepted as a candidate species by the California Fish and Game Commission pursuant to Fish and Game Code Section 2074.2.
capital cost	A lump-sum cost that includes those costs associated with the startup of a project or program (e.g., planning, design, construction, power costs for initial filling of reservoirs, activation costs, operation and maintenance costs before initial operation).

Term	Definition
carryover storage	Water remaining in storage in a reservoir or lake at the end of a water year.
catch	Within a recreational fishery area, refers to the number of fish captured.
census	A compilation of data on an aspect of the U.S. people and/or economy provided by the U.S. Bureau of the Census.
Central Valley Habitat Joint Venture (CVHJV)	As defined by Section 3403(c) of the CVPIA, "the association of federal and State agencies and private parties established for the purpose of developing and implementing the North American Waterfowl Management Plan as it pertains to the Central Valley of California." The CVHJV brings together federal, State, and private organizations to implement the North American Waterfowl Management Plan in the Central Valley of California. The CVHJV program, signed in 1986 between Canada and the United States, sets goals for duck, goose, and swan populations and identifies wetland habitat conservation needs in specific regions.
Central Valley Project (CVP)	Federally operated water management and conveyance system that provides water to agricultural, urban, and industrial users in California as defined by Section 3403(d) of the CVPIA, "all Federal reclamation projects located within or diverting water from or to the watershed of the Sacramento and San Joaquin rivers and their tributaries as authorized by the Act of August 26, 1937 (50 Stat. 850) and all Acts amendatory or supplemental thereto,"
Central Valley Project Improvement Act (CVPIA)	Public Law 102-575, Title 34. The CVPIA was signed into law by the President in October 1992. The CVPIA mandates major changes in management of the CVP particularly for the protection, restoration, and enhancement of fish and wildlife. Responsibilities for implementing the CVPIA are shared by the U.S. Department of the Interior, Bureau of Reclamation (Reclamation), and USFWS. The CVPIA puts fish and wildlife on an equal footing with agricultural, municipal, industrial, and hydropower users.
Central Valley Project Operations Criteria and Plan (OCAP)	A description of the regulatory and physical constraints and conditions under which the CVP and SWP currently operate.
Central Valley Project service area	As defined by Section 3403(e) of the CVPIA, "that area of the Central Valley and San Francisco Bay Area where water service has been expressly authorized pursuant to the various feasibility studies and consequent congressional authorizations for the Central Valley Project."
Central Valley Project water	As defined by Section 3403(f) of the CVPIA, "all water that is developed, diverted, stored, or delivered by the Secretary of the Interior in accordance with the statutes authorizing the Central Valley Project in accordance with the terms and conditions of water rights acquired pursuant to California law."
Central Valley Project water service contractor	Water users who have contracted with Reclamation for water developed by and conveyed through CVP facilities.
channel	Natural or artificial watercourse, with a definite bed and banks to confine and conduct continuously or periodically flowing water.
community noise equivalent level (CNEL)	The energy average of the A-weighted sound levels occurring during a 24-hour period with 5 dB added to the A-weighted sound levels occurring during the period from 7 a.m. to 10 p.m. and 10 dB added to the A-weighted sound levels occurring during the period from 10 p.m. to 7 a.m.

Term	Definition
Completeness	One of four criteria in the P&Gs that must be considered in the formulation of each alternative plan under consideration. The other three criteria are Acceptability, Effectiveness, and Efficiency. Completeness is the extent to which a given alternative plan provides and accounts for all necessary investments or other actions to ensure the realization of the planned effects. This may require relating the plan to other types of public or private plans if the other plans are crucial to realization of the contributions to the objective.
conference	The interagency cooperation process required for a federal action that is likely to jeopardize the continued existence of a species proposed for listing, or result in the destruction or adverse modification of proposed critical habitat.
confined aquifer	An aquifer bounded above and below by impermeable or confining layers of distinctly lower permeability than the aquifer itself.
confluence	The flowing together of two or more streams; the place of meeting of two or more streams.
conjunctive use	The planned use of groundwater in conjunction with surface water in overall management to optimize water resources.
conjunctive water management	The planned and managed operation of a groundwater basin and a surface storage system combined through a coordinated conveyance infrastructure to maximize the efficient use of surface and groundwater resources.
conservation	Actions taken to minimize or compensate for project effects on ecosystem resources or to benefit or promote the recovery of listed species as an integral part of a proposed action
conservation measure	Actions to benefit or promote the recovery of listed species that are included by a federal agency as an integral part of a proposed action. These actions will be taken by the federal agency or applicant, and serve to minimize or compensate for project effects on the species under review. These measures may include actions taken before the initiation of a consultation, or actions that the federal agency or applicant has committed to complete in a BA or similar document.
conservation recommendation	A suggestion that USFWS or NMFS may provide with a BO describing discretionary conservation actions; it is advisory and does not carry any binding legal force.
conserve	To protect/maintain individual organisms, populations, species, or natural resources by planned actions.
conserved water	Water resulting from contractor operations and practices that results in less use of the allocated supply.
consultation	The process required of a federal agency when any activity authorized, carried out, or conducted by that agency may affect a listed species or designated critical habitat; consultation is with USFWS or NMFS and may be either informal or formal.
consumptive water use	Water made unavailable for recapture and reuse as a result of direct surface evaporation or being taken up by plants.
contaminants	Any undesirable physical, chemical, biological, or radiological substance present in water as a result of human activities.
contractual entitlement	A water entitlement based on a contract, such as a contract with Reclamation for CVP water.
Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES)	CITES (1973) regulates or prohibits international commerce for plant and animal species believed to be harmed by or that may be harmed by international trade. The authority to implement this is under Section 8 of the federal ESA.

Term	Definition
conveyance agreement	An agreement (contract) between Reclamation and certain entities (usually water districts) for that entity to convey water supplied by Reclamation from CVP water supplies or Reclamation water acquisitions to designated wildlife refuges.
conveyance capacity	The rate at which water can be transported by a canal, aqueduct, or ditch. In this document, conveyance capacity is generally measured in cubic feet per second.
conveyance losses	Evaporation, evapotranspiration, and seepage losses in major conveyance canals. Also referred to as "losses."
conveyance	The movement or transportation of water from one location to another location through various water transportation systems, such as canals, sloughs, channels, pipelines, ditches, etc.
Cooperating Agency	Under NEPA, any federal agency other than the lead agency that has jurisdiction by law or special expertise with respect to any environmental impact involved in an action requiring an EIS. The USFWS, U.S. Army Corps of Engineers (USACE), U.S. Forest Service, and NMFS are cooperating agencies for the Shasta Lake Water Resources Investigation (SLWRI).
cost-effective	A case where the financial benefits of a project are greater than the overall cost.
Critical Habitat	A description of the specific areas with physical or biological features essential to the conservation of a listed species and that may require special management considerations or protection. These areas have been legally designated via Federal Register notices.
cubic feet per second (cfs)	A measure of the volume rate of water movement. As a rate of stream flow, a cubic foot of water passing a reference section in 1 second of time. One cubic foot per second equals 0.0283 meters per second (7.48 gallons per minute). One cubic foot per second flowing for 24 hours produces approximately 2 acre-feet.
cumulative effect	Those effects of future activities that is reasonably certain to occur within the action area of a federal action subject to consultation.
Cumulative Effect	CEQA Guidelines Section 15355 defines cumulative effects as "...two or more individual impacts that, when considered together, are considerable or that compound or increase other environmental effects (this can be the result of a single project or number of separate projects). The cumulative effect of several projects is the change in the environment that results from the incremental impact of the project when added to other closely related past, present, or reasonably foreseeable, probable future projects." (State CEQA Guidelines Section).
Cumulative Effect (CESA)	Cumulative effects are not defined under the CESA; however, CESA implementing regulations require that applications for incidental take permits include an analysis of whether or not the issuance of the incidental take permit would jeopardize the continued existence of a species based on three considerations, one of which is "...reasonably foreseeable impacts on the species from other related projects and activities." (California Code of Regulations 783.2(a)(7)(C).

Term	Definition
Cumulative Effect (ESA)	The USFWS regulations define cumulative effects under Section 7 of the federal ESA as "...those effects of future State or private activities, not involving federal activities, that are reasonably certain to occur within the action area of the federal action subject to consultation" (50 CFR 402.02). This definition applies to the Action-Specific Implementation Plan species that are covered under the CALFED Bay-Delta BOs (USFWS 2000, NMFS 2000).
Cumulative Effect (NEPA)	For the NEPA, federal regulations (40 CFR 1508.7) define cumulative effects as those effects that result from incremental impacts of a proposed 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. Cumulative effects can result from individually minor but collectively significant actions that take place over time.
day-night noise level (Ldn)	The energy average of the A-weighted sound levels occurring during a 24-hour period, with 10 dB added to the A-weighted sound levels occurring during the period from 10 p.m. to 7 a.m.
decibel (dB)	A unitless measure of sound on a logarithmic scale, which indicates the squared ratio of sound pressure amplitude to reference sound pressure amplitude. The reference pressure is 20 micropascals.
Decision-1485 (D-1485)	The State Water Resources Control Board Water Right Decision 1485.
Decision-1641 (D-1641)	State Water Resources Control Board water rights decision (March 2000) that implemented the 1995 Bay-Delta Water Quality Control Plan.
dedicated water	Refers to the 800,000 acre-feet of CVP yield identified in Section 3406(b)(2) of the CVPIA that the Secretary of the Interior must dedicate and manage for the primary purpose of implementing the fish and wildlife purposes and measures of the act, to help California protect the Bay-Delta Estuary, and to help meet legal obligations imposed on the CVP under State and federal law, including the federal ESA.
delist	To remove an animal or plant species from the list of endangered and threatened wildlife and plants.
delta	A low, nearly flat alluvial tract of land formed by deposits at or near the mouth of a river. In this report, "Delta" refers to the delta formed by the Sacramento and San Joaquin rivers.
Delta	See Sacramento-San Joaquin River Delta.
density	The mass of a substance per unit of volume of that substance (i.e., the density of water changes with changes in temperature).
depletion	Represents water consumed in a service area or no longer available as a source of supply.
design flood capacity	Also called design flood or design level of flood protection. The computed flow volume, stage, or frequency of the event for which protection is provided or activities need to be regulated.
diel	A daily cycle, usually encompassing 1 day and 1 night.
discount rate	Factor used to convert future monetary values to present values. (Econ Eval for PF)

Term	Definition
dissolved oxygen (DO)	A commonly employed measure of water quality. The concentration of free (not chemically combined) molecular oxygen (a gas) dissolved in water, usually expressed in milligrams per liter, parts per million, or percent of saturation. DO levels are considered the most important and commonly employed measurement of water quality and indicator of a water body's ability to support desirable aquatic life.
distinct population segment (DPS)	A subdivision of a vertebrate species that is treated as a species for purposes of listing under the ESA. To be so recognized, a potential distinct population segment must satisfy standards specified in a USFWS or NMFS policy statement (see the February 7, 1996, Federal Register, pages 4,722-4,725). DPS standards require a DPS to be separable from the remainder of, and significant to, the species to which it belongs.
diversion	The act of taking water out of a river system or changing the flow of water in a system for use in another location.
diversion point	The point at which water flow is redirected from a particular conveyance vehicle (i.e., stream, canal) into a different conveyance vehicle (i.e., slough, ditch).
dry-farmed	Crop production without the use of irrigation.
Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies (P&G)	The P&Gs for Water and Related Land Resources Implementation Studies (U.S. Water Resources Council, 1983) guides federal agencies in the identification of a project planning alternative that maximizes net economic benefits (the national economic development, or "NED," alternative).
ecosystem	An interactive system that includes the organisms of a natural community association together with their abiotic physical, chemical, and geochemical environment.
Effectiveness	One of four criteria in the P&Gs that must be considered in the formulation of each alternative plan under consideration. The other three criteria are Acceptability, Completeness, and Efficiency. Effectiveness is the extent to which an alternative plan alleviates the specified problems and achieves the specified opportunities.
Efficiency	One of four criteria in the P&Gs that must be considered in the formulation of each alternative plan under consideration. The other three criteria are Acceptability, Completeness, and Effectiveness. Efficiency is the extent to which an alternative plan is the most cost effective means of alleviating the specified problems and realizing the specified opportunities, consistent with protecting the Nation's environment.
Electrical conductivity (EC)	The measurement of a materials ability to conduct an electrical current. Used as a surrogate measurement for salinity
elevation	Elevation in feet above mean sea level
emergent	Flooded or ponded areas that support rooted, herbaceous vegetation with parts of the shoot both below and above water.
endangered species	Any species or subspecies of bird, mammal, fish, amphibian reptile, or plant that is in serious danger of becoming extinct throughout all or a significant portion of its range.

Term	Definition
Endangered Species Act of 1973, as Amended	<p>Federal legislation that is intended to provide a means to conserve the ecosystems upon which endangered and threatened species depend, and to provide programs for the conservation of those species, thus preventing extinction of plants and animals. The law is administered by the USFWS (U.S. Department of the Interior) and NMFS (U.S. Department of Commerce), depending on the species. Some relevant sections are as follows:</p> <ul style="list-style-type: none"> • § Section 4 Part – Addresses the listing and recovery of species and designation of critical habitat. • § Section 6 Part – Focuses on cooperation with the States and that authorizes USFWS and NMFS to provide financial assistance to States that have entered into cooperative agreements supporting the conservation of endangered and threatened species. • § Section 7 Part – Requires all federal agencies, in consultation with USFWS or NMFS, to use their authorities to further the purpose of the federal ESA and to ensure that their actions are not likely to jeopardize the continued existence of listed species or result in destruction or adverse modification of critical habitat. • § Section 9 – Part Defines prohibited actions, including the import and export, take, possession of illegally taken species, transport, or sale of endangered or threatened species. • § Section 10 – Lays out the guidelines under which a permit may be issued to authorize prohibited activities, such as take of endangered or threatened species. • § Section 10(a)(1)(A) – Allows for permits for the taking of threatened or endangered species for scientific purposes or for purposes of enhancement of propagation or survival. • § Section 10(a)(1)(B) – Allows for permits for incidental taking of threatened or endangered species.
endemic species	A species restricted to and known to occur naturally only within a specific geographic area.
endemism	Native or limited to a certain region (endemic).
energetic requirements	The food energy needed by organisms to meet their metabolic demands and carry on their normal activities. For warm-blooded organisms, this includes the energy needed to maintain body temperature.
enhancement	Measures that develop or improve the quality or quantity of existing conditions or resources beyond a condition or level that would have occurred without an action
Enhancement of Survival Permit	A type of permit issued by the USFWS under the authority of Section 10(a)(1)(A) of the federal ESA. It permits an otherwise prohibited action that benefits the conservation of a listed species.
entrainment	The incidental trapping of fish and other aquatic organisms in water diverted from streams, rivers, and reservoirs; the process of drawing fish into diversions along with water, resulting in the loss of such fish.
environmental baseline	Detailed information about habitat conditions and species populations that exist before a project begins.
environmental consequences	For a project, the impacts to the affected environment that are expected from implementation of a given alternative.
Environmental Impact Statement (EIS)	An analysis required by the NEPA for all major federal actions that evaluates the environmental risks of alternative actions.

Term	Definition
Environmental Impact Report (EIR)	An analysis required by the CEQA for all major State actions, which evaluates the environmental risks of alternative actions.
Environmental Quality (EQ) Account	One of four accounts established in the P&Gs to facilitate evaluation and display of effective alternative plants. The other accounts include National Economic Development (NED), Regional Economic Development (RED), and Other Social Effects (OSE). The EQ account displays nonmonetary effects on significant natural and cultural resources.
Environmentally Preferable Alternative	The alternative that will promote the national environmental policy as expressed in NEPA. Ordinarily, this means the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources.
Environmentally Superior Alternative	As required by CEQA, an EIR's analysis of alternatives must identify the environmentally superior alternative among all those considered. If the No Project Alternative is identified as environmentally superior, then the EIR also must identify the environmentally superior alternative among the other alternatives.
ephemeral stream	A stream with intermittent or seasonal flow.
epilimnion	The upper, wind-mixed layer of a thermally stratified lake. This water is turbulently mixed throughout at least some portion of the day, and because of its exposure, can freely exchange dissolved gases (such as oxygen and carbon dioxide) with the atmosphere.
equity	The state, ideal, or quality of being just, impartial, and fair.
equivalent sound level (Leq)	The equivalent steady-state sound level that in a stated period of time would contain the same acoustical energy.
erosion	The gradual wearing away of land by water, wind, and general weather conditions; the diminishing of property by the elements. With regard to levees specifically: Loss of levee material as a result of the effects of channel flows, tidal action, boat wakes, and wind-generated waves.
escapement	The number of adult salmon that successfully "escape" the ocean fishery and return to freshwater habitats to spawn.
Essential Experimental Population	An experimental population whose loss would appreciably reduce the prospect of survival of the species in the wild. All other experimental populations are nonessential.
estuary	Regions of interaction between rivers and nearshore ocean waters, where river flow and tidal action mix freshwater and saltwater.
eutrophication	The degradation of water quality as a result of enrichment by nutrients, primarily nitrogen and phosphorus, which in turn results in excessive plant (principally algae) growth and decay.
evaporation	The change of a substance from the liquid phase to the gaseous (vapor) phase.
evapotranspiration (ET)	Water evaporated from plant and soil surfaces or transpired by plant tissues.
Evapotranspiration of Applied Water (ETAW)	Portion of evapotranspiration provided by applied water.

Term	Definition
evolutionarily significant unit (ESU)	A population or group of populations that is considered distinct (and hence a “species”) for purposes of conservation under the ESA. To qualify as an ESU, a population must (1) be reproductively isolated from other conspecific populations, and (2) represent an important component in the evolutionary legacy of the biological species.
exotic species	Any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to an ecosystem, and whose introduction does or is likely to cause economic or environmental harm or harm to human health.
experimental population	A population (including its offspring) of a listed species designated by rule that is wholly separate geographically from other populations of the same species. An experimental population may be subject to less stringent prohibitions than are applied to the remainder of the species to which it belongs.
export	Water diversion from the Delta used for purposes outside the Delta.
Extended Study Area	The lower Sacramento River corridor from Red Bluff Diversion Dam south to the Delta, the Delta, and the CVP and SWP service areas.
extinct species	A species that no longer exists. For the federal ESA, a species currently believed to be extinct.
extirpated species	No longer surviving in regions that were once part of the species’ range.
fallowed land	Cultivated land that lies idle during a growing season.
fall period	October 1 through November 30.
Feasibility Report	A report for consideration by Congress on the technical and financial feasibility of potential water resources project alternatives.
Feasibility Study	A structured study to develop a Feasibility Report. Feasibility studies are initiated with congressional authorization to address specified objectives.
Federal Interest	Alternative plans are determined to have Federal interest if they are consistent with the 1983 U.S. Water Resources Council Principles and Guidelines for Water and Related Land Resources Implementation Studies (P&Gs), provide positive National Economic Development (NED) benefits as described in the P&Gs, and are consistent with the mission and authorities of one or more Federal agencies.
Federal Objective	The federal objective of water and related resources project planning is to contribute to national economic development consistent with protecting the Nation’s environment, pursuant to national environmental statutes, applicable executive orders, and other federal planning requirements.
Federal Register	The official daily publication for Rules, Proposed Rules, and Notices of federal agencies and organizations, as well as Executive Orders and other presidential documents.
field irrigation efficiency	The efficiency of water application. Computed by dividing the evapotranspiration of applied water by applied water and converting the result to a percentage. Efficiency may be computed at three levels: farm, district, or basin.
fill	A man-made deposit of soil or other materials.
firm water supplies	Noninterruptible water supplies guaranteed by the supplier to be available at all times except for reasons of uncontrollable forces or continuity of service provisions.

Term	Definition
fiscal year (FY)	Federal Government “fiscal year” period from and including October 1 of each calendar year through September 30 of the following year.
fish ladders	A series of ascending pools constructed to enable salmon or other fish to swim upstream around or over a dam.
fish passage facilities	Features of a fish passage barrier that enable fish to move around, through, or over without harm. Generally, an upstream fish ladder or a downstream bypass system.
fisheries	A season or industry of commercial or sport fishing.
fishery	A community of fish and their habitat.
fishery flow pattern	Pattern of river flows needed for spawning, incubation, and rearing of young fish as well as migration of juvenile and adult fish.
flood storage reservation	The storage in a reservoir used to reduce the river’s flow downstream in a flood event.
floodplain	Part of a river valley composed of unconsolidated, river-borne sediment that is periodically flooded.
floodway	The channel of a river or other watercourse and adjacent land areas that convey flood waters.
flow	The volume of water passing a given point per unit of time.
	Instream Flow Requirements – Amount of water flow in a stream course required to sustain instream values.
	Minimum Flow – Lowest flow in a specified time period.
	Peak Flow – Maximum instantaneous flow in a specified time period.
forebay	Water stored behind a dam; specifically, water intended to go through a turbine.
formal consultation	The required process between USFWS or NMFS and a federal agency or applicant conducted when a federal agency determines its action is likely to adversely affect a listed species or its critical habitat; used to determine whether the proposed action is likely to jeopardize the continued existence of listed species or adversely modify critical habitat. This determination is stated in a BO.
fragmentation of habitat	Division of a large piece of habitat into a number of smaller, isolated patches that typically have substantially less ecological value than the contiguous habitat.
fry	Fry are salmon, steelhead, or other fish that have absorbed their yolk sac and emerged from the redd. They typically use low velocity, shallow habitats near the river banks. In the Central Valley, salmon fry are frequently defined as juveniles smaller than 50 millimeters in fork length.
Full pool	The volume of water in a reservoir when the reservoir is fully used for all project purposes, including flood control

Term	Definition
Fully Protected species	The classification of Fully Protected was the State's initial effort in the 1960s to identify and provide additional protection to those animals that were rare or faced possible extinction. Lists were created for fish, mammals, amphibians and reptiles, birds and mammals. Please note that most fully protected species have also been listed as threatened or endangered species under the more recent endangered species laws and regulations. Fully Protected species may not be taken or possessed at any time and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research and relocation of the bird species for the protection of livestock.
gap analyses	Using a geographical information system to identify gaps in the representation of biological diversity in areas managed for long-term maintenance of populations of nature species and natural ecosystems.
geographic information system (GIS)	A computer system that allows for input and manipulation of geographic data to allow researchers to manipulate, analyze, and display the information in a map format.
GHG	greenhouse gas
grilse	A precocious salmon or anadromous trout that has matured at a much smaller size and usually younger age (2-year-old) than that of the fully grown adult fish (3-year-old and older).
groundwater	Any water naturally stored underground in aquifers, or that flows through and saturates soil and rock, supplying springs and wells.
groundwater banking	Storage of water in a groundwater basin for later and planned use by intentionally recharging the basin.
groundwater level	Refers to the water level in a well, and is defined as a measure of the hydraulic head in the aquifer system.
groundwater management	The planned and coordinated management of a groundwater basin or portion of a groundwater basin with a long-term sustainability of the resource.
groundwater overdraft	A condition of a groundwater basin in which the amount of water withdrawn by pumping exceeds the amount of water that recharges the basin over a period of years, during which water supply conditions approximate average.
groundwater pumping	Quantity of water extracted from groundwater storage.
groundwater recharge	The natural or intentional infiltration of surface water into the zone of saturation.
groundwater storage	The quantity of water in the zone of saturation.
groundwater table	The upper surface of the zone of saturation, except where the surface is formed by an impermeable body.
habitat	The specific places where the environmental conditions (i.e., physical and biological conditions) are present that are required to support occupancy by individuals or populations of a given species.
Habitat Conservation Plan (HCP)	A plan that outlines ways of maintaining, enhancing, and protecting a given habitat type needed to protect species; usually includes measures to minimize impacts, and may include provisions for permanently protecting land, restoring habitat, and relocating plants or animals to another area. Under Section 10(a)(2)(A) of the federal ESA of 1993, as amended, a planning document that is a mandatory component of an incidental take permit application; also known as a Conservation Plan.

Term	Definition
harass	To intentionally or negligently, through act or omission, create the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns such as breeding, feeding, and sheltering (defined by USFWS regulation; NMFS has not defined harass by regulation).
harm	An act that actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns including breeding, feeding, or sheltering (50 CFR 17.3).
heavy metals	A metal of atomic weight greater than 23 that forms soaps on reaction with fatty acids. Examples are aluminum, lead, cobalt.
historic range	Those geographic areas the species was known or believed to occupy in the past.
hydraulics	Study of the practical effects and control of moving water; used to refer to the relationship among channel geometry and flow, velocity, and depth of water.
hydrograph	A chart or graph showing the change in flow over time for a particular stream or river.
hydrostatic pressure	The pressure of water at a given depth resulting from the weight of the water above it.
hypolimnion	The bottom, and most dense, layer of a stratified lake. It is typically the coldest layer in the summer and warmest in the winter. It is isolated from wind mixing and typically too dark for much plant photosynthesis to occur.
implementation schedule	An outline of actions, with responsible parties, estimated costs and timeframes, for meeting the recovery objectives described in a species recovery plan.
incidental take	Take of listed fish or wildlife species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by a federal agency or applicant.
Incidental Take Permit (Federal)	Federal exception to Section 9 of the federal ESA (16 USCA 1538); a permit issued pursuant to Section 10 of the federal ESA (16 USCA 1539(a)(1)(B)).
Incidental Take Permit (California)	A permit issued for take of species under the CESA Section 2081.
indicator species	Organism, species, or community that indicates presence of certain environmental conditions.
indirect effect	An effect caused by an action that takes place later in time than the action, but is still reasonably certain to occur.
informal consultation	An optional process that includes all discussions, correspondence, etc., between USFWS or NMFS and a federal agency or a designated non-federal representative before formal consultation, if required.
intactness	The visual integrity of the natural and artificial landscape and its freedom from encroaching elements. Intactness can be present in well-kept urban and rural landscapes, as well as natural settings.
interbasin transfer	Water transfers from entities outside a watershed to entities within a watershed.
interest group	An agency or other entity that has expressed an interest, verbally or in writing, in becoming more involved in the development of a planned project.
Investigation	Abbreviation for the Shasta Lake Water Resources Investigation
IPCC	Intergovernmental Panel on Climate Change

Term	Definition
irrigation water	Water used primarily in the production of agricultural crops or livestock, including domestic use incidental thereto, and the watering of livestock. Irrigation water does not include water used for domestic uses, such as watering landscaping or pasture for animals (e.g., horses) that are kept for personal enjoyment. It generally applies only to landholdings greater than 2 acres.
jeopardize the continued existence of	To engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species.
Jeopardy Opinion	The USFWS or NMFS opinion that an action is likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of critical habitat. The finding includes reasonable and prudent alternatives, if any.
joint costs	Costs that cannot be readily assigned to a single beneficiary or purpose, typically because they serve multiple users or purposes.
joint point of diversion (JPOD)	A joint point of diversion is a water diversion facility shared among two or more agencies or groups, such as the joint use of the Banks and Jones pumping plants by both the CVP and SWP.
juvenile	Young fish older than 1 year but not having reached reproductive age.
land cover type	The dominant features of the land surface. A land cover type can be defined by natural vegetation, water, or human uses (e.g., agricultural lands, landscaping).
land retirement	Permanent or long-term removal of land from agricultural production.
lead agency	The government agency that has the principal responsibility for carrying out or approving a project and therefore the principal responsibility for preparing CEQA/NEPA documents. For the SLWRI, Reclamation is the federal lead agency under NEPA. At the time of publication of this DEIS, the State lead agency under CEQA had not yet been determined.
lead office	The USFWS field office responsible for coordinating all or most actions taken to study, propose, list, conserve, and delist a species. The lead office is given the lead responsibility over the entire range of a species, including anywhere it occurs in other regions.
lead region	The USFWS region responsible for coordinating all actions taken to study, propose, list, conserve, and delist a species.
Least Environmentally Damaging Practicable Alternative (LEDPA)	As required by Section 404 of the federal Clean Water Act (CWA), an applicant for a 404 permit must demonstrate to the USACE that, among other things, the proposed project is the least environmentally damaging practicable alternative to achieve the project's purpose.
levee	A natural or artificial embankment that constrains the flow of water to a channel.
Level 2 Refuge Water Supply (L-2)	The minimum supply of water required at certain federal, State, and private refuges for basic development and management of suitable habitat conditions for migrating waterfowl and wildlife pursuant to CVPIA Public Law 102-575, Title 34, Section 3406 (d)(1); measured in acre-feet of water. Level 2 Water is water provided from the CVP yield and non-project water (existing water rights, entitlement water).

Term	Definition
Level 4 Refuge Water Supply (L-4)	The full amount of water required at certain federal, State, and private wildlife refuges for optimum development and management of suitable habitat conditions for migrating waterfowl and wildlife, pursuant to CVPIA Public Law 102-575, Title 34, Section 3406 (d)(2); measured in acre-feet of water.
level of service (LOS)	A standard measurement used by transportation officials that reflects the relative ease of traffic flow on a scale of A to F, with free flow being rated LOS A and congested conditions rated as LOS F.
limiting factors	The stressors that significantly influence the abundance and productivity of animal populations, including salmon.
limnology	Scientific study of the physical characteristics and biology of lakes, streams, and ponds.
listed species	Any species of fish, wildlife, or plant that has been determined to be endangered or threatened under Section 4 of the federal ESA of 1993, as amended, or under the CESA.
listing	The formal process through which USFWS or NMFS adds species to the federal list of endangered and threatened wildlife and plants.
long-term contract	CVP contract with terms of more than 10 years.
losses, also conveyance losses	Water lost through evaporation, seepage, and related occurrences during conveyance of water.
mainstem	The main course of a stream.
major construction activity	A construction project (or other undertaking having similar physical effects) that is a major federal action significantly affecting the quality of the human environment, as referred to in NEPA 42 U.S.C. 4332(2)(C).
maximum sound level (L_{max})	The maximum sound level measured during the measurement period.
mean sea level (msl)	The average height of the sea's surface over a long period.
Memorandum of Understanding (MOU)	A means of gaining formal consensus between two or more parties on a particular complex issue.
minimum sound level (L_{min})	The minimum sound level measured during the measurement period.
mitigation	To moderate, reduce, or alleviate the impacts of a proposed activity; includes, in order, (1) avoiding the impact by not taking a certain action or parts of an action; (2) minimizing impacts by limiting the degree or magnitude of the action and its implementation; (3) rectifying the impact by repairing, rehabilitating, or restoring the affected environment; (4) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and (5) compensating for the impact by replacing or providing substitute resources or environments.
model	A tool used to mathematically represent a process that could be based on empirical or mathematical functions. Models can be computer programs, spreadsheets, or statistical analyses.
Multi-Species Conservation Strategy (MSCS)	The CALFED Bay-Delta programmatic BA for compliance under Section 7 of the federal ESA and programmatic Natural Community Conservation Plan under the California Natural Community Conservation Plan Act. The MSCS includes a program-level description of impacts on MSCS-evaluated species resulting from implementation of CALFED programmatic actions and identifies programmatic conservation measures for avoiding, minimizing, and compensating impacts on evaluated species and NCCP communities.

Shasta Lake Water Resources Investigation

Term	Definition
National Economic Development (NED) Account	One of four accounts established in the P&Gs to facilitate evaluation and display of effective alternative plants. The other accounts include OSE, RED, and EQ. The NED account displays changes in the economic value of the national output of goods and services.
National Economic Development (NED) Plan	A plan that reasonably maximizes NED benefits is to be formulated and identified as the NED Plan, consistent with the federal objective of protecting the Nation's environment, pursuant to national environmental statutes, applicable executive orders, and other federal planning requirements.
National Environmental Policy Act (NEPA)	Federal legislation establishing the national policy that environmental impacts will be evaluated as an integral part of any major federal action. Requires the preparation of an EIS for all major federal actions significantly affecting the quality of the human environment.
National Wildlife Refuge (NWR)	A refuge managed by the USFWS.
Natural Community Conservation Plan (NCCP)	A plan prepared pursuant to the Natural Community Conservation Planning Act that identifies and provides for the regional or areawide protection and perpetuation of natural wildlife diversity, while allowing compatible and appropriate development and growth.
Natural Community Conservation Plan (NCCP) Permit	Findings and approval made by the DFG that explains and substantiates DFG's approval of an NCCP in accordance with the requirements of the NCCP Act and the CESA.
Natural Community Conservation Planning Act (NCCPA)	A California law providing for regional or areawide planning for natural wildlife diversity, and compatible and appropriate development and growth. (See Fish and Game Code 2800 et seq.)
NCCP habitat	Broad habitat categories, each of which includes a number of habitat or vegetation types recognized in frequently used classification systems. The Multi-Species Conservation Strategy includes an evaluation of 18 NCCP habitats.
No-Action Alternative	Represents conditions that would occur if the Federal Government did not take additional actions toward implementing a plan to raise Shasta Dam to help increase anadromous fish survival in the upper Sacramento River, nor help address the growing water supply and reliability issues in California.
NOD	North-of-Delta
noise	Sound that is loud, unpleasant, unexpected, or otherwise undesirable.
nonconsumptive water use	Water uses, including swimming, boating, waterskiing, fishing, maintenance of stream-related fish and wildlife habitat, hydropower generation, and other uses that do not substantially deplete water supplies.
No Jeopardy Opinion	USFWS or NMFS finding that an action is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of critical habitat.
nonnative species	Botanical, wildlife, and aquatic species that originate elsewhere and are brought into a new area, where they may dominate the local species or in some way negatively affect the environment for native species.
noxious weed	An alien, introduced or exotic undesirable species that is aggressive and overly competitive with more desirable native species.

Term	Definition
Operations Criteria and Plan (OCAP)	See Central Valley Project Operations Criteria and Plan (OCAP).
opportunity cost	The cost of forgoing certain opportunities or alternatives in favor of pursuing others.
other direct benefits	Incidental direct benefits of a project over and above the direct outputs for which the plan is being formulated.
Other Social Effects (OSE) Account	One of four accounts established in the P&Gs to facilitate evaluation and display of effective alternative plans. The other accounts include NED, RED, and EQ. The OSE account registers plan effects from perspectives that are relevant to the planning process, but are not reflected in the other three accounts.
P	precipitation
P&G	See Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies
parr	The life stage for salmon that is distinguished by its dark parr marks, and when the salmon is large enough to use mid-channel habitats. In the Central Valley, parr are defined as juveniles between 50 and 70 millimeters in fork length.
peak particle velocity (PPV)	The maximum velocity of a particle in vibrating medium such as soil. PPV is usually expressed in inches per second.
percentile-exceeded sound level (L _x)	The sound level exceeded "x" percent of a specific time period. L ₁₀ is the sound level exceeded 10 percent of the time.
percolation	The downward movement of water through the soil or alluvium to the groundwater table.
perennial	Flows continuously throughout the year.
performance standard	Objectives established for conservation measures that, when achieved, indicates that the conservation measures have been successfully implemented in accordance with terms of a final Action-Specific Implementation Plan.
permeability	The ease with which water passes through sediment, depending on the composition and degree of packing of the sediment and viscosity of the water.
place of use (POU)	The geographic area specified in a water right permit or license issued by the California State Water Resources Control Board, wherein the water may be used.
point of delivery (POD)	The location(s) at which Level 2 and Incremental Level 4 water supplies are deemed to be delivered to a refuge boundary.
preferred alternative	An alternative recommended based upon a NEPA evaluation
preliminary proposed plan	The plan that has been preliminarily selected based on the Federal planning guidelines in the 1983 <i>Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies</i> (P&Gs). The preliminary proposed plan is used for illustrative purposes within this document. It is recognized that additional refinement and changes may occur to this and other alternatives after additional operational analyses and responses to comments by concerned agencies, stakeholders, and the public.
preserve	To <u>protect, keep, or maintain</u> the <u>condition of</u>
Primary Study Area	The area surrounding Shasta Dam and Reservoir, the lower portions of all contributing major and minor tributaries affected by increasing storage in Shasta Lake, and the Sacramento River corridor from Shasta Dam downstream to Red Bluff Diversion Dam

Shasta Lake Water Resources Investigation

Term	Definition
Program Environmental Impact Report (PEIR)	An EIR prepared before a State agency's decision regarding a major program, plan, or policy. It is usually broad in scope and followed by subsequent more narrowly focused CEQA compliance documents such as project-specific EIRs.
Program Environmental Impact Statement (PEIS)	An EIS prepared before a federal agency's decision regarding a major program, plan, or policy. It is usually broad in scope and followed by subsequent more narrowly focused NEPA compliance documents such as project-specific Environmental Assessments and EISs.
Program Environmental Impact Statement/Report (PEIS/R)	A single document prepared jointly by federal and State agencies before a decision regarding a major program, plan, or policy. It is usually broad in scope and followed by subsequent more narrowly focused NEPA or CEQA compliance documents such as project-specific Environmental Assessments and EISs.
project levees	Refers to levees within the federal Flood Control Project, which was authorized by Congress in 1917 as the Sacramento Flood Control Project and completed by the USACE in 1960. This Project comprises designated federal levees along portions of the Sacramento River, Sutter, Steamboat, Georgianna, Cache and Lindsey Sloughs, the Deep Water Ship Channel, the San Joaquin River, Paradise Cut, parts of Old River and other tributary channels in the Delta. Non-project levees are those levees that are not federal, or Project Levees. Local districts are responsible for maintaining these levees and can be reimbursed for a portion of the costs under the Delta Levee Subvention Program of 1973 or the Delta Flood Protection Act of 1988.
proposed action	For the SLWRI, the proposed action is to modify the existing Shasta Dam and Reservoir.
proposed species	A species of animal or plant that is proposed in the Federal Register to be listed under Section 4 of the federal ESA.
public involvement	Process of obtaining citizen input into each stage of the development of planning documents. Required as a major input into any EIS or EIR.
public trust	The legal doctrine that protects the rights of the public to use water courses for commerce, navigation, fisheries, recreation, open space, preservation of ecological units in their natural state, and similar uses for which those lands are uniquely suited. It is based on the California State Constitution and goes back to English Common Law. The California Supreme Court states, "The state has an affirmative duty to take the public trust into account in the planning and allocation of water resources, and to protect public trust uses whenever feasible." National Audubon (33Cal.3d 419 1983).
reasonable and prudent measure (RPM)	An action that USFWS or NMFS believes necessary or appropriate to minimize the impacts (the amount or extent) of incidental take caused by an action that was subject to consultation.
recharge	The processes of water filling the voids in an aquifer, which causes the piezometric head or water table to rise in elevation.
reclaimed water	Municipal, industrial, or agricultural wastewater treated and/or managed to produce water of quality suitable for additional uses.
Reclamation	U.S. Department of the Interior, Bureau of Reclamation
Reclamation Laws	As defined by Section 3403(l) of the CVPIA, "the Act of July 18, 1902 (82 Stat. 388) and all Acts amendatory thereof or supplemental thereto."

Term	Definition
Reclamation Reform Act (RRA)	The RRA of 1982 (Public Law 97-293, 96 Stat. 1263) was signed by the President on October 12, 1982. While retaining the basic principle of limiting the amount of owned land that may receive irrigation water deliveries from Reclamation projects, the RRA introduced the concept of full-cost pricing (including interest on the unpaid plant investment) for certain irrigation water deliveries to leased lands.
reclassify	To change a species' official status from threatened to endangered or vice-versa.
Record of Decision (ROD)	Concise, public, legal document required under the NEPA that identifies and publicly and officially discloses the responsible official's decision on an alternative selected for implementation. It is prepared following completion of an EIS.
recovery	The process by which the decline of an endangered or threatened species is stopped or reversed, or threats to its survival neutralized so that its long-term survival in the wild can be ensured, and it can be removed from the list of threatened and endangered species.
Recovery Outline	The first USFWS or NMFS recovery document provided for a listed species. While brief, the document serves to direct recovery efforts pending the completion of the species' recovery plan.
Recovery Permit	A permit issued under section 10(a)(1)(A) of the federal ESA for scientific research and other activities benefiting the recovery of federally listed species, allows for research pertaining to species recovery, such as taking blood samples from a peregrine falcon for genetic analysis, or conducting surveys of freshwater mussel beds to determine species status and distribution.
Recovery Plan	A document drafted by the USFWS, NMFS, or other knowledgeable individual or group, that serves as a guide for activities to be undertaken by federal, State, or private entities in helping to recover and conserve endangered or threatened species.
recovery priority	A rank, ranging from a high of 1C to a low of 18, whereby priorities are assigned to listed species and recovery tasks; assignment of rank is based on degree of threat, recovery potential, taxonomic distinctiveness, and presence of an actual or imminent conflict between the species and development activities.
recovery unit	A subunit of the listed entity, geographically or otherwise identifiable, that is essential to the recovery of the entire listed entity, and conserves genetic or demographic robustness, important life history stages, or other features for long-term sustainability of the entire listed entity. Recovery units are optional but, where used, should collectively encompass the entire listed entity. Recovery criteria for the listed entity should address each identified recovery unit, and every recovery unit must be recovered before the species can be delisted.
redd	A nest prepared by a female salmon in streambed gravel, where she deposits her eggs.
refuge	Wildlife refuges -- certain portions of land set aside and managed by the USFWS or DFG to provide a water supply and vegetative habitat for migrating waterfowl and wildlife.

Shasta Lake Water Resources Investigation

Term	Definition
Regional Economic Development (RED) Account	One of four accounts established in the P&Gs to facilitate evaluation and display of effective alternative plants. The other accounts include NED, OSE, and EQ. The RED account registers changes in the distribution of regional economic activity that result from each alternative plan. Evaluations of regional effects are to be carried out using nationally consistent projections of income, employment, output, and population.
reservoir	Artificially impounded body of water.
reservoir storage capacity	Reservoir capacity normally usable for storage and regulation of reservoir inflows to meet established reservoir operating requirements.
resource conservation district (RCD)	An independent special district, separate from county, State, and federal agencies and self-governed by a board of directors, that is charged with locally securing "the adoption...of conservation practices including, but not limited to, farm, range, open space, urban development, wildlife, recreation, watershed, water quality, and woodland, best adapted to save the basic resources, soil, water, and air of the state from unreasonable and preventable waste and destruction" (California Public Resources Code, Section 9001(a)(1)).
restoration	Measures that develop or improve the quality or quantity of existing conditions or resources
return flows	Water returned to the natural surface water system after use by the water user.
riffle	A shallow reach with swiftly flowing, turbulent water and some partially exposed river bed material.
riparian	Vegetation or other resources associated with a river that are dependent on groundwater and floodwater controlled by the river. The land adjacent to a natural watercourse such as a river or stream. Riparian areas often support vegetation that provides important wildlife habitat, and important fish habitat values when growing large enough to overhang the bank
riparian corridor	Land adjacent to creeks, rivers, and streams where vegetation is strongly influenced by the presence of water.
riparian vegetation	Of, adjacent to, or living on, the bank of a river or, sometimes, of a lake, pond, etc.
riparian water rights	Exist for lands which abut a waterway, or which overlie an underground stream.
riprap	A protective blanket of large loose stones, placed in random fashion on the upstream and downstream faces of embankment dams, streambanks, on a reservoir shore, on the sides of a channel, or other land surfaces to protect them from erosion or scour caused by current, wind, and/or wave action.
Sacramento-San Joaquin River Delta (the Delta)	As described in Section 12220 of the California Water Code, an area that generally extends from Sacramento to the north, Tracy to the south, Interstate 5 to the east, and Collinsville to the west. The Delta covers approximately 738,000 acres.
SacSMA/Snow17	"Sacramento Soil Moisture Accounting" surface water runoff model coupled to "Snow17" snowpack development and melt model, applied by the National Weather Service River Forecast Centers to support operational hydrologic forecasting

Term	Definition
Safe Harbor Agreement	A voluntary agreement signed by USFWS or NMFS and a property owner and any other cooperators that (1) sets forth specific management activities that the non-federal property owner will undertake or forgo to provide a net conservation benefit to species covered by the agreement, and (2) provides the property owner with the Safe Harbor assurances described within the agreement and authorized in an Enhancement of Survival Permit.
safe yield	The amount of water that can be withdrawn from a groundwater basin without producing an undesired result such as depletion of groundwater reserves, intrusion of water of undesirable quality, excessive depletion of stream flow by induced infiltration, or land subsidence.
salinity	The amount of dissolved salts in a given volume of water.
salmonids	Fish of the family Salmonidae, such as salmon and trout (including steelhead).
salts	Compounds derived from the reaction of an acid and a base.
Scientific Take Permit	See Recovery Permit.
scoping	The process of defining the scope of a study, primarily with respect to the issues, geographic area, and alternatives to be considered. The term is typically used in association with environmental documents prepared under the NEPA and CEQA.
scour	Removal of soil or fill material by the flow of floodwaters. The term is frequently used to describe storm-induced, localized conical erosion around pilings and other foundation supports where the obstruction of flow increases turbulence.
Section 10	Part of the federal ESA, as amended, that provides the guidelines under which a permit may be issued to authorize prohibited activities, such as take of endangered or threatened species.
Section 215 Water	Water defined under Section 215 of the Reclamation Reform Act of 1982 as unstorable irrigation water to be released because of flood control criteria or unmanaged flood flows.
Section 4(d) Rule	A regulation developed by USFWS or NMFS establishing prohibitions that apply for a threatened species. Any prohibitions adopted must be those necessary and advisable to provide for conservation of the species.
Section 7	Part of the federal ESA, as amended, that requires all federal agencies, in consultation with USFWS or NMFS, to use their authorities to further the purpose of the federal ESA and to ensure that their actions are not likely to jeopardize the continued existence of listed species or result in destruction or adverse modification of critical habitat.
Section 9	Part of the federal ESA, as amended, that defines prohibited actions, including import and export, take, illegally taken possession of illegally taken species, transport, or sale of endangered or threatened species.
sediment	Rock and mineral particles transported by water. Sediment relevant to wetlands tends to be relatively fine because the low gradients involved do not transport larger particles.
sedimentation	The deposition by settling of a suspended material.
seepage	The movement of water through a porous material in response to a hydraulic gradient.
seismicity	The frequency, intensity, and distribution of earthquake activity in an area.

Shasta Lake Water Resources Investigation

Term	Definition
separable costs	Costs that are specifically necessary because a purpose is included in a multipurpose project
settlement	A downward movement of a surface as a result of underlying soil compression or consolidation caused by an increased load or the loss of underlying soil (foundation) support.
Shasta Lake Water Resources Investigation (SLWRI)	SLWRI is being conducted pursuant to federal legislation that authorizes the feasibility study (Public Law 96-375 and 108-361).
short-term contract	CVP contracts with a term of more than 5 years but less than 10 years.
similarity of appearance	A species may be treated as endangered or threatened if it resembles in appearance a species that has been listed under Section 4, and if enforcement personnel would have difficulty distinguishing between the listed and unlisted species; if the effect of this difficulty is an additional threat to the listed species; and if such treatment of the unlisted species would improve protection for the listed species. A similarity of appearance listing must be promulgated or formalized by rule.
SLR	Sea level rise
smolt	A young salmon that has assumed the silvery color of the adult and is ready to migrate to the sea.
snags	Fallen branches, any dead or dying standing tree, washed-out shrubs, and small logs. Snags are important for the provision of food, shelter, and breeding places for animals in the water.
SOD	South-of-Delta
sound	A vibratory disturbance created by a vibrating object, which, when transmitted by pressure waves through a medium such as air, is capable of being detected by a receiving mechanism, such as the human ear or a microphone.
spawner	Parental stock of a fish. Typically refers to an adult anadromous fish, like a salmon, on its upstream migration to spawn.
spawning	The releasing and fertilizing of eggs by fish.
special-status species	Federal and State classifications for plant and animal species that either are listed as threatened or endangered, are formally recognized candidates for listing, or are declining to a point where they may be listed
species of concern	An informal term referring to a species that might be in need of conservation action. This may range from a need for periodic monitoring of populations and threats to the species and its habitat, to the necessity for listing as threatened or endangered. Such species receive no legal protection and use of the term does not necessarily imply that a species will eventually be proposed for listing. A similar term is "species at risk," which is a general term for listed species as well as unlisted ones that are declining.
spill	Water released from reservoirs to comply with flood control criteria.
spillway	Overflow structure of a dam.
SRES	IPCC Special Report on Emissions Scenarios
stage	Water surface elevation; the elevation above mean sea level (msl), typically measured in feet msl.
stakeholder	Anyone who lives in a watershed or has land management, administrative, or other responsibilities or interests in it. Stakeholders may be individuals, businesses, government agencies, or special-interest groups

Term	Definition
State Water Project (SWP)	A California State water storage and conveyance system that pumps water from the Delta for agricultural, urban, domestic, and industrial purposes. The SWP was authorized by legislation in 1951 and consists of 22 dams and reservoirs, which delivers water 600 miles from the Sacramento Valley to Los Angeles.
stream	Natural watercourse.
	Ephemeral Stream – an ephemeral stream is a stream, or a reach of a stream, that flows only in direct response to precipitation. It receives no protracted supply from melting snow or other source, and its channel is, at all times, above the water table.
	Intermittent or Seasonal Stream – A stream, or a reach of a stream, that does not flow year-round and that flows only when (a) it receives baseflow solely during wet periods, or (b) it receives groundwater discharge or protracted contributions from melting snow or other erratic surface and shallow subsurface sources.
	Perennial stream – Flows continuously throughout the year.
stressors	Physical, chemical, or biological perturbations to a system that adversely affect ecosystem processes, habitats, and species. Examples include water diversions, dams, reservoirs, weirs, levees, bridges and bank protection, dredging and sediment disposal, gravel mining, invasive aquatic plants, invasive aquatic organisms, invasive riparian and salt marsh plants, nonnative wildlife, predation and competition, contaminants, wildfire, fish and wildlife harvest, and artificial fish propagation.
subsidence	A local mass movement that involves principally the gradual downward settling or sinking of the earth's surface with little or no horizontal motion. It may be due to natural geologic processes or mass activity such as removal of subsurface solids, liquids, or gases, groundwater extraction, and wetting of some types of moisture-deficient loose or porous deposits.
subspecies	A taxonomic rank below that of species, usually recognizing individuals that have certain heritable characteristics distinct from other subspecies of a species.
succession	The change in the composition and structure of a biological community over time in the absence of major disturbance (e.g., fire, flood, land clearing) in which the community modifies the physical environment to eventually establish an ecosystem that is as stable as possible at the site in question.
surface water diversion	Water that is diverted and/or pumped from aboveground sources such as rivers, streams, reservoirs, and lakes, as opposed to groundwater, which is pumped from an aquifer.
suspended load	Sediment that is transported by suspension in the water column of a stream or river.
sustainable yield	Sustainable yield is a balance between pumping and basin recharge, and is expressed as the number of acre-feet of water per year that can be pumped from a basin on a long-term average annual basis.
SWP	State Water Project
T	temperature
TAF	1,000 acre-feet, a unit-measure of volume
tailwater	Water immediately downstream from a dam.

Term	Definition
take	Under the federal ESA, "To harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" in regard to federally listed, endangered species of wildlife (16 USCA 1532[19]). "Harm" is further defined as an act "which actually kills or injures." Harm may include "significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter" (50 CFR 17.3). Under the California Fish and Game Code, take is defined as "to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill" (California Fish and Game Code Section 86).
temporary contract	Contract with a term of less than 5 years.
terms and conditions	Required actions described in an Incidental Take Permit or Incidental Take Statement intended to implement reasonable and prudent measures.
terrestrial species	Types of species of animals and plants that live on or grow from the land.
threatened species	Legal status afforded to plant or animal species that are likely to become endangered within the foreseeable future throughout all or a significant portion of their range, as determined by the USFWS or the NMFS. Also refers to those species listed as threatened under the CESA.
tiering	NEPA or CEQA procedure that allows a lead agency to avoid duplication of paperwork through incorporation by reference of the general discussions and relevant specific discussions from an environmental compliance document of broader scope into a subsequent project-specific environmental document of narrower scope.
total supply	Total water supply available to an area (surface water plus groundwater).
toxins	Substances that cause damage to a living tissue, impairment of the central nervous system, severe illness, or death when ingested, inhaled, or absorbed by the skin.
trace elements	A chemical element used by organisms in minute quantities and essential to their physiology.
transfers, sales, and exchanges	A transfer or sale is a one-way transaction to another contractor, usually on an annual basis, but could be on a permanent basis. An exchange is a two-way transaction wherein a contractor transfers water to another contractor to be returned at a later date. CVP contractors may transfer, sell, and exchange to other contractors their contractual water supply only with written consent from the United States.
tributary	A stream flowing into a larger stream or a lake.
trustee agencies	Agencies that have jurisdiction over certain resources held in trust for the people of California but do not have legal authority over approving or carrying out the project. The DFG is a trustee agency for the SLWRI.
unity	The visual coherence and compositional harmony of the landscape considered as a whole; it frequently attests to the careful design of individual components in the artificial landscape.
vividness	The visual power or memorability of landscape components as they combine in striking or distinctive visual patterns.
water acquisition	The procurement (purchase) of water by Reclamation from willing sellers for delivery to and use by wildlife refuges.

Term	Definition
water conveyance	The flow capacity of a channel related to the hydraulic radius, used to describe the flow in channels.
water rights	California recognizes riparian and appropriative water rights.
	Riparian Water Rights – Exist for lands that abut a waterway, or that overlie an underground stream. Generally, there is no riparian right to diffused surface waters or swamps. The extent of the frontage along a waterway in no way governs the quantity of the water right. Use of water through riparian rights must be on riparian land and within the watershed of a stream. Riparian rights may not be lost as a result of nonuse.
	Appropriative Water Rights – Water rights based on the principle of prior appropriations, or “first in time, first in right.” To maintain appropriative water rights, the right to any water must be put to beneficial use. Nonuse of appropriative water rights may result in the loss of those water rights. In a conflict between a riparian water user and an upstream appropriator, the riparian user has priority, provided that the water is being used in a reasonable and beneficial manner.
water supply reliability	The certainty or degree to which water supplies are available for agricultural, municipal and industrial, and environmental purposes. For example, the degree to which water service contract holders receive their full-service contract amounts within acceptable quality, timing, and other service standards.
water transfer	Sales of water from the rights holder to another user by mutual agreement.
water use efficiency	The beneficial reduction in water use, waste and loss to satisfy a particular purpose. It is the reduction in water use accomplished by implementation of water conservation or water efficiency measures. It is improved water management practices that reduce or enhance the beneficial use of water.
water year	The period of time beginning October 1 of one year and ending September 30 of the following year and designated by the calendar year in which it ends. Water Year 2008, for example, begins October 1, 2007, and ends September 30, 2008. Water years are typically used in analyses of water supply rather than calendar years.
waters of the United States	As defined in CWA Section 404: Navigable waters of the United States, interstate waters, all other waters where the use or degradation or destruction of the waters could affect interstate or foreign commerce, tributaries to any of these waters, and wetlands that meet any of these criteria or are adjacent to any of the above.
watershed	The total land area that drains to any point in a stream. An area that drains to a particular channel or river, usually bounded peripherally by a natural divide of some kind such as a hill, ridge, or mountain.
WCRP	World Climate Research Program
wetland	Areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Shasta Lake Water Resources Investigation

Term	Definition
wildlife habitat relationship (WHR)	The California statewide Wildlife-Habitat Relationship model was developed by the DFG to generate reports describing the terrestrial vertebrates and their habitats expected to occur at any location within California. Reports include a list of wildlife species project to occur in a given location and set of habitat conditions as well as life history and habitat descriptions.
Wildlife Management Area (WMA)	A refuge managed by the DFG.
willing sellers	A term used to describe entities (water districts, agencies, individuals, etc.) who would be interested in selling their water supplies under transfer guidelines established by the State Water Resources Control Board and other regulatory agencies.
willingness to pay	The expressed amount an individual would pay for a good or service. For goods or services sold in a market environment, this corresponds to the amount actually paid to obtain the goods or services. For nonmarket goods, it corresponds to the expressed amount an individual would be willing to pay to receive the stated benefits.
X2	The location (measured in kilometers from the Golden Gate Bridge) of 2 parts per thousand total dissolved solids. The length of time X2 must be positioned at set locations in the estuary each month is determined by a formula that considers the previous month's inflow to the Delta and a "Level of Development" factor, denoted by a particular year. X2 is currently used as the primary indicator in managing Delta outflows. The X2 indicator is also used to reflect a variety of biological consequences related to the magnitude of fresh water flowing downstream through the estuary and the upstream flow of salt water in the lower portion of the estuary. The outflow that determines the location of X2 also affects both the downstream transport of some organisms and the upstream movement of others and affects the overall water operations of the CVP and SWP.
yd ³	cubic yard(s)
yield	As defined in Public Law 108-361, firm yield is defined as the quantity of water from a project or program that is projected to be available on a reliable basis, given a specified level of risk, during a critically dry period. Average yield is generally measured as long-term average annual water supply. Firm yield generally measured as dry year reliability, and is similar to firm water supply.
year to date (YTD)	A current year cycle beginning and including the first day of that established cycle (i.e., water year, fiscal year, calendar year) and ending on the latest date of inquiry of the cycle (often for business/economic results).