El Dorado County Water Agency

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Mr. Ajay Goyal, P.E., SE, Manager
Statewide Infrastructure Investigations Branch
Division of Statewide Integrated Water Management
Department of Water Resources
901 P Street, Room 213A
Sacramento, California 95814

Dear Ajay:

The El Dorado County Water Agency (Agency) is pleased to offer the following comments to assist your staff and the Water Commission in developing the pending Regulations/Guidelines intended to help identify selection criteria that will direct funding for new storage reservoirs across California. These comments are structured as a recitation of the particular benefits associated with upper basin, or high elevation storage projects, such as the Alder Creek Reservoir project in El Dorado County. The attached graphic (Source Area Reservoir Perspectives in California) is provided as context.

Source Area Watersheds Offer the Greatest Flexibility

First and foremost, we believe that it is important that any new storage initiative occur where runoff is first generated. To do so best captures the natural hydrology of California and ensures the highest potential of putting public trust water resources to maximum beneficial use. When water is stored at high elevations, potential energy is conserved and the options for water managers to put that water to maximum beneficial use, across wide environmental landscapes, and over the entire year are significantly enhanced. It is consistent with the simple though ineradicable truth that, *California's runoff starts uphill*. Reservoirs at lower elevations or, in the Central Valley for example, while still providing numerous public benefits, cannot by design offer the same range of public benefits as reservoirs at higher elevations. From these higher elevations for example, water can be used for efficient and clean power generation (also in closed-loop pumped storage designs), flood attenuation in downstream CVP/SWP reservoirs and facilities, specialized recreational activities such as white water rafting, local/regional water supply, coldwater pool conservation in downstream CVP/SWP reservoirs, local instream flow and habitat enhancement, and the re-wetting of local wetlands, among many others. As source area watersheds, water quality is probably the best of any storage reservoir; there is no upstream source to dilute or otherwise contaminate inflow to the reservoir. Runoff flows directly into the reservoir from the surrounding hillsides. This volume, rather than flowing as a flood wave that gains turbidity before entering a downstream reservoir such as Folsom Reservoir, is captured virtually pristine at its source. No other existing reservoir storage option, including the CALFED storage options can make that claim.

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As a central theme to our comments, we believe that the higher in the system water is stored, the greater the opportunities for putting that water to beneficial use.

Such a new storage reservoir would include the proposed Alder Creek Reservoir project (175 TAF), located in the headwater catchment of Alder Creek, a tributary of the South Fork American River with its confluence near Kyburz, east of Placerville. This project is not a new concept and its history can be traced back many decades to the South Fork American River Project (SOFAR) and one that the Agency is proactively pursuing today through a USBR Sacramento-San Joaquin basin study.

Public Safety – Flood Control

Located high in the major tributary watersheds of the CVP/SWP, a primary benefit of high elevation storage reservoirs would be flood control attenuation, both locally and regionally. A modest storage impoundment in the upper American River watershed for example, would provide enduring benefits to the entire reach of the South Fork American River from Kyburz to Folsom Reservoir. The devastating effects of the flood along the South Fork in 1997, where levees are not practicable, could have been significantly reduced with a new 175 TAF reservoir upstream. In Folsom Reservoir, a new 175 TAF capacity impoundment upstream would also provide measurable benefits to existing flood control operations at the reservoir. New reservoirs such as these should be integrated into existing Statewide (e.g., CV Flood Protection Plan) and local flood planning (e.g., Sacramento/Natomas Basin).

Water Supply – Regional/Local

New upstream reservoirs should ideally be located in areas anticipated to serve a growing population base. Proximity to users would limit the need for costly conveyance. An Alder Creek Reservoir, upstream of the planned growth corridor in El Dorado County would serve just that purpose. The primary northern California east/west development corridor is along Interstate 80 and State Hwy 50. Anticipated growth eastward along the Hwy. 50 corridor could be accommodated by a local supply that would be primarily conveyed via gravity. Without such a new reservoir, this growth would need to be accommodated through time-consuming, disruptive, costly, and avoidable long-term pumping commitments from Folsom Reservoir. Moreover, proper siting of new facilities can also avoid costly and antiquated principles in water distribution infrastructure. For example, a new Temperature Control Device at the El Dorado Irrigation District intake in Folsom Reservoir would likely be unnecessary were a new upstream storage reservoir available since additional pumping capacity at the existing reservoir intake may not be required.

Downstream Environmental Flow Enhancement

Like any new storage reservoir, the new yield generated would provide benefits downstream. For example, it could provide the water necessary to support OCAP-related flow augmentation to maintain Delta outflow, X2, Rio Vista flows, chloride minimums and other Bay-Delta Water Quality Standards as well as the more recently imposed Actions from the Reasonable and Prudent Alternatives of the U.S. Bureau of Reclamation's *Long-Term Operation of the CVP and SWP*, such as the Fall Actions involving water temperature management. A new upstream reservoir, by capturing water traditionally lost through flood evacuation, provides downstream environmental flow enhancement and water quality protection.

Local/Regional Environmental Flow Enhancement

Locally, an upstream reservoir would provide a new and unique opportunity to enrich the habitat quality of small order tributaries (like Alder Creek) and its lower echelon river reaches (South Fork American River) that traditionally did not have the benefit of an upstream supply source for such functions (i.e., upper watershed runoff is traditionally run-of-the-river).
Areas along these reaches could be assessed for potential improvement and include adjacent wetlands, side/back channels, and hydrologically linked backwater ponds.

Proximal Flexibility

Across the CVP/SWP, Folsom Reservoir has long served as a *first-responder* to late season imbalanced conditions in the Delta. The travel distance for managed releases from Folsom Reservoir is the shortest of the major CVP/SWP reservoirs. A new reservoir upstream would provide Folsom Reservoir with that much greater flexibility to make robust contributions to meet these periodic needs without compromising existing water supply obligations to local/regional contractors. Proximity to the areas of need is an important criterion; a new reservoir in the more distant reaches of the State would not necessarily possess the same real-time benefits for in-Delta and export needs as a more proximal facility.

Institutional Simplicity

As a facility unattached or unassociated with the other CALFED reservoir options, upstream reservoirs would not be encumbered by operational integration with existing federal or State water projects. As part of integrated water resources management, any such project would undoubtedly want to explore mutually beneficial coordination and collaboration. In fact, to maximize system-wide benefits, integration would be highly desirable such as inclusion within an IRWMP. But by being separate and independent from the federal/State water project system, regulatory approvals, administrative oversight, contracting, and public/stakeholder input would be controlled by a single local water agency.

Water Rights Simplicity

A *first-in-the-chain* storage reservoir in the upper basins would arguably make water rights straightforward if area-of-origin statutes are exercised. No upstream water rights would exist and downstream water rights would be ostensibly usurped through the area-of-origin edict. This does not necessarily imply that any water rights filings would remain uncontested or that the hearing process would be short, but area-of-origin represents a powerful, though largely untested principle, upon which agencies sponsoring reservoirs of these types would rely.

Water Supply - Statewide

Any supply augmentation would benefit water needs Statewide and all new reservoirs would clearly provide that benefit. Depending on their location, however, relative to existing reservoirs, they could also have a positive effect on inter-annual yield determinations and actually increase system yield even if precipitation and basin runoff do not change. A system with enhanced storage facilities would have the potential to retain greater carryover from year to year than the current system of reservoirs, if they are properly sequenced (i.e., aligned within the drainage network and not off-stream). So, even if for example climate change reduces overall precipitation and overall runoff decreases, relative to historic conditions, a new system of enhanced storage reservoirs, <u>if properly positioned</u>, could actually generate *increased yield*, relative to current conditions.

Clean Energy Production

All new storage reservoirs should serve multiple functions. In fact, hydropower generation is a prerequisite. Water has always been a clean, natural, and readily available medium that can generate electricity. As the water-energy nexus becomes a leading issue across the U.S., it becomes increasingly desirable to enjoin the two. The age of single function facilities (e.g., levees) are being rapidly outdated as the costs, maintenance, environmental effects, and questionable effectiveness make their future increasingly tenuous. New storage facilities must serve a diverse array of functions and hydropower generation, in an era of clean energy, is becoming a prerequisite. Wind, solar, tidal, geothermal are laudable green energy alternatives, but do not provide adequate flexibility to ramp up generation during peak power demand periods. Only hydroelectric generation can provide grid balancing and other *societal* needs (e.g., flood control and water supply). High elevation storage, in many cases, would also supplement power generation at existing downstream powerhouses.

Economic Benefits

The economic reality of today compels us to explore facilities that can not only provide multiple benefits, but also generate revenue. Those that can generate a long-term, stable, and environmentally-clean revenue stream should be set apart from others that do not. Hydropower generation represents a natural, technically feasible, and permanent revenue source from upstream reservoirs.

Reduce Pumping

An important objective for water utility managers is to minimize energy use in the conveyance of water from its source to its treatment and distribution and in fact been identified by the Air Board as key to the implementation of AB 32. Pumping uphill, while necessary across California in many instances and for a variety of reasons, is contrary to the fundamental rule of water resources management, which is, where possible rely on gravity. Fortunately in California, we enjoy a diverse topographical landscape, one distinct in elevation, where precipitation conveniently falls in areas that allow us to rely on gravity, if we choose. An energy conscious California should expect its water resources industry to embrace the need to conserve energy and avoid pumping.

Direct Climate Change Mitigation

Climate induced shifts in California's annual hydrology will alter traditional spring peak flows. Anticipated runoff volumes, while expected to gradually change, will be overshadowed by the seasonal shift in timing which is predicted to be much more rapid. Late-fall and mid-winter runoff will be the highest since the traditional snowpack is providing less and less of the annual runoff. High elevation storage reservoirs have the ability to capture this precipitation directly where it occurs. Downstream reservoirs, while also effective at storing this winter pulse, still must rely on run-of-the-river (or deliberate) releases from upstream reservoirs to fill; the point being that many miles of river course would come under high discharge rates before entering a new downstream storage reservoir. High elevation storage reservoirs would eliminate that additional flood risk. As a direct mitigative action to offset anticipated shifts in Sierra Nevada/Southern Cascades snowpack decline, no other storage option offers the immediate ability to adapt to a changing flow regime.

Anadromous Fish Passage Issues – Facility Related

The life cycles and habitat needs of listed anadromous fish in California are closely scrutinized whenever the waterways of their various lifestage migrations are involved. This is clearly established under the requirements of the federal Endangered Species Act (ESA). High elevation storage reservoirs, upstream of existing impoundments, fortunately are not, and would not be subject to such concern. A preliminary assessment by NOAA Fisheries/NMFS to determine Area of Potential Effect would likely conclude that a proposed facility outside of existing migratory routes and currently made impassable due to existing CVP/SWP facilities would make ESA consultation with the Department of Commerce on the facility itself a non-issue. Upstream reservoirs would in fact generate benefit without infringing upon, disturbing, or otherwise adversely affecting any of California's highly sensitive listed anadromous fish species.

Anadromous Fish Issues – Operations Related

Located upstream of existing CVP/SWP facilities, operations of these new upstream reservoirs would not affect current protective measures for instream anadromous fish. Reservoir operations at CVP/SWP terminal reservoirs already accommodate the need for flow and temperature modulation (i.e., release scheduling) in those downstream reaches managed through existing Biological Opinion requirements. If anything, new upstream impoundments would provide added benefit and flexibility to those existing facilities to meet current ESA requirements.

Fisheries Enhancement through Coldwater Pool Augmentation

By their nature, high elevation reservoirs store cold water. Their ability to impound coldwater is unique among storage reservoir alternatives. Additionally, if situated upstream of existing facilities (e.g., CVP/SWP dams), such reservoirs could provide protection against unwanted loss of existing coldwater from their downstream counterparts. Nowhere is this more relevant than in the American River watershed where, because of Folsom Reservoir's limited capacity, relative to its draining watershed, reservoir spills for flood control often inadvertently dispose of coldwater. These coldwater assets are indispensible later in the year. An upstream reservoir (to Folsom) would allow reservoir operator's the flexibility of retaining more real-time storage during the winter flood season knowing that they would have upstream retention capacity for unpredictable or under-estimated flood events.

Minimization of Disruptions in Public Services

Located in remote upper headwater basins, the potential for public service disruptions (e.g., traffic delays, proximity to sensitive receptors from construction noise/air quality, water/sewer line replacement, public risks from levee failures, etc.) is significantly reduced. Public benefits could accrue without the same level of traditional trade-offs for public service disruptions, inconvenience, and safety concerns that other facilities in or near highly populated areas might experience. Since such facilities are in very remote areas, the risk of eminent domain filings is also greatly reduced; the existing population is not displaced or adversely affected.

Minimization of Facility Footprint

A deep confined reservoir in a mountainous setting would have a much smaller footprint than a shallow, broad, extensive facility in the Central Valley or in the Foothills. The overall extent of the impoundment structures (e.g., levees and dams) can be much less than a facility situated in more gentle terrain. The opposite extreme would be a facility in the Delta which would require impoundment in a full 360-degree circle. A deep confined reservoir would result in less converted acreage (i.e., less clearing and land conversion) than their Foothill or valley floor counterparts. In a high elevation setting, loss of productive agricultural or grazing lands would also be virtually zero.

Minimize Evaporative Loss

A deep reservoir will also have a smaller evaporation/volume ratio than a shallow reservoir. Evaporative losses in much of California, owing to its Mediterranean climate are very high. As future air temperatures continue to increase, overall evaporation rates will also rise. To best ensure maximum beneficial use of the State's water resources and minimize evaporative loss, facilities should avoid high evaporative loss regions where possible. Cooler, high elevation locations are preferred over the Central Valley floor from an evaporative loss perspective; there is little rationale to knowingly place reservoirs in areas with the highest evaporation rates. The reservoirs themselves should provide deep storage and be protected, to the extent possible, from unabated sun exposure. Upstream reservoirs in mountainous terrain are typically flanked by high relief. The mid-summer azimuth angle of the sun, while high, is offset to some degree in late afternoon by the high surrounding relief.

Year Round Recreational Opportunities

Any new reservoir today must provide multi-purpose uses. With public funds being expended on such facilities, the public expects that the benefits reach the widest possible user base. Located in the El Dorado National Forest, high within the Sierra Nevada, the recreational opportunities for an upstream reservoir such as the Alder Creek Reservoir project would provide a wide range of recreational and associated economic benefits.

Benefitting from the unspoiled waters and scenery of the Sierra Nevada; camping, fishing, swimming, boating, recreational water craft, hiking, and picnicking would be available. Tourism would be actively promoted with the California Department of Parks and Recreation, El Dorado County, local chambers of commerce, and individual small business entrepreneurs. Spin-off businesses could assist the local economy through park concessions, bait/tackle shops, boat rentals, outdoor

equipment, KOA campgrounds, grocery stores, restaurants, etc. This could represent a significant diversification and employment benefit to such small communities as Kyburz and Pollock Pines. Winter activities at the reservoir could include cross-country skiing, ice fishing, and snowmobiling and could offer an alternative winter recreational respite to the Interstate 80 corridor. No other reservoir option would provide this range of year-round recreational opportunity and local economic sustenance.

Unique Recreational Opportunities

Taking advantage of the elevation profile of the outlet stream along its entire length and the fact that releases would be controlled (together with hydropower operations), a unique opportunity for white-water rafting exists. The South Fork American River is noted as one of the best white-water rafting rivers in California.

Cultural/Heritage Benefits

Hydraulic mining, forestry, and irrigation ditches/flumes for water and power generation have a long and storied history in this region of the Sierra Nevada. This rich cultural background captures important early elements of the industries of our State (e.g., 49ers). A new reservoir and power generation facility in the heart of this historic environment could retain various key relics, integrating them into public displays, and offering visitors a glimpse into the past. Again, coordination with the Department of Parks and Recreation, Office of Historical Preservation, and El Dorado County tourism would best promote these important cultural attributes.

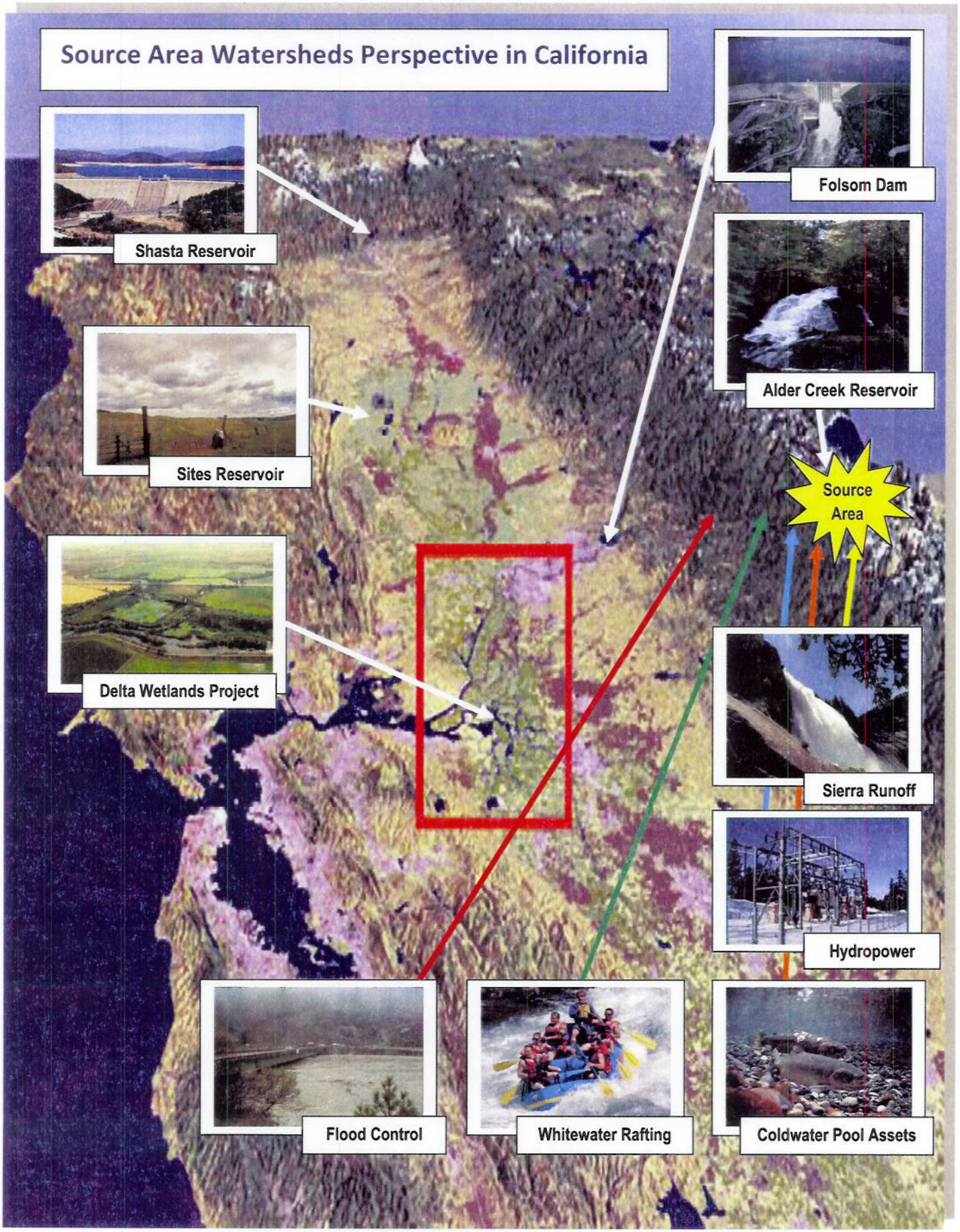
The preceding comments represent some of the many benefits and particulars we feel strongly support the genre of new reservoir storage projects in upstream or source area watersheds. In fact, these advantages and attributes have been well known to the people of El Dorado County and the Agency for many years and are the reason why a project such as the Alder Creek Reservoir project has never lost impetus and, why today, we remain earnestly committed to it.

Our team would be pleased to talk and/or meet with you and your staff should you require any further enhancement of these comments or wish more details on the Alder Creek Reservoir project. I thank you for the opportunity to provide you with our comments and know that you and your staff will give them careful consideration.

Sincerely yours,

Dave Eggerton
General Manager

Attachment: EDCWA Comment Letter


Source Area Watersheds Perspective in California
Shasta Reservoir
Folsom Dam
Alder Creek Reservoir
Sites Reservoir
Source Area
Delta Wetlands Project
Sierra Runoff
Hydropower
Flood Control
Whitewater Rafting
Coldwater Pool Assets