

The background of the cover features a dam with multiple spillways at the top, with white water cascading over them. Below the dam, a river flows rapidly over dark, jagged rocks, creating white foam and splashing water. The overall color palette is dominated by blues, greens, and whites, with a slightly desaturated, naturalistic feel.

RIVERS of POWER

A Citizen's Guide to River Restoration through Hydropower Reform

BY FRIENDS OF THE RIVER AND THE CALIFORNIA HYDROPOWER REFORM COALITION



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Friends of the River
and the
California Hydropower Reform Coalition

Friends of the River (FOR) is California's statewide river conservation organization. Working to protect and restore rivers for more than 30 years, it has played a key role in improving hydroelectric operations in the state.

The California Hydropower Reform Coalition (CHRC) unites and coordinates over 35 organizations dedicated to protecting and enhancing California rivers affected by federally-regulated hydropower dams. CHRC members work to ensure hydropower projects are operated to support the full range of benefits our rivers provide, including the protection of fish and wildlife habitat and public recreation opportunities.

Credits

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CALIFORNIA RIVERS are at RISK

FROM high mountain springs to lowland coastal creeks, California's 194,000 miles of rivers and streams drain a vast, diverse landscape. Within their channels and along their banks, these waters support dozens of native fish and other aquatic species. In addition, millions of state residents and tourists annually flock to California rivers to hike, swim, boat and fish. These recreational opportunities renew individual spirits and bolster local economies.

California's rivers are seriously threatened. Today, more than two-thirds of the state's native fish species are extinct, endangered, or declining and almost every river in California has been dammed or otherwise diverted.

These magnificent waterways are also hardworking public servants. Rivers are owned by the public and have been developed to support public purposes. They are dammed and re-routed to provide drinking water, crop irrigation and hydroelectric power. Yet, as with all natural resources, we are challenged to find a balance between use and protection.

Many of the 300 non-federal hydropower dams in California are operated to maximize power generation. They divert up to 95 percent of a river's natural flow into pipes or canals leaving miles of stream without water. Other facilities cause wildly fluctuating flows that erode soil and vegetation, and endanger fish, wildlife and people. It is not uncommon in California for stretches of major rivers to run dry during summer months when utilities withhold or divert water to maximize energy production during peak energy demand.

Most hydropower dams were constructed prior to the enactment of our nation's environmental laws and have therefore been operating under antiquated terms for decades. These state- and utility-owned dams receive federal operating licenses that last 30 to 50 years. During this license term dam owners are not expected to modify projects in order to meet evolving environmental laws. No other energy sector receives such a free pass to avoid compliance. Not until the license expires is there an opportunity to evaluate how a project has impacted the natural environment and the public's right to clean, accessible rivers. New licenses require dam owners to take common sense measures that improve habitat for fish and wildlife, reduce impacts to water quality and increase opportunities for public recreation.

The hydropower licensing process offers a unique opportunity to restore balance to California's most treasured rivers and streams. In the next fifteen years, over 150 dams will apply for new operating licenses. California has entered a critical era — a time when we have tremendous opportunity to restore a cherished resource, our public rivers.



STEVE EVANS



ALLEN HARTHORN



STEVE EVANS

Top: Iron Gate Dam is the first blockade to over 300 miles of fish habitat on the Klamath River.

Middle: During the summer of 2003 low flows and high temperatures contributed to a disease outbreak, which killed thousands of spring-run Chinook salmon in Butte Creek above PG&E's Centerville Powerhouse.

Bottom: Almost all the flow on the Lower Kern River is diverted into the Rio Bravo Canal.

HYDROPOWER DAMS HARM RIVERS



LINSEY PERNELL

Dams Disrupt River Flows

The volume, timing and temperature of a river's flow impact everything from habitat quality to reproductive cues for fish to bankside vegetative growth. Many hydropower dams seasonally divert as much as 95 percent of a river's water, reducing flows to a mere trickle in some reaches. In addition, generating power can pulse flows downstream and wreak havoc on aquatic communities. Larger dams with reservoirs often retain winter and spring flows that would naturally flush and renew river ecosystems.



STEVE EVANS

Dams Block Fish and Wildlife Migration

Dams block the upstream and downstream migration of fish and other aquatic organisms. Loss of habitat has been a critical factor in the decline of the state's migratory fish species. Some dams may be retrofitted with fish ladders, although these structures are costly and not completely effective. Dams also block the natural movement of nutrients and sediment that create habitat, nourish banks and replenish beaches.



STEVE EVANS

Dams Degrade Temperature and Water Quality

When dams divert water out of the natural streambed, water temperatures generally rise — often to levels that cannot sustain healthy fisheries or dilute natural or man-made pollutants. Dams can also degrade water quality by reducing the oxygen content of downstream flows and trapping sediment and pollutants in reservoirs.



KARUK TRIBE

Toxic algal blooms harmful to both humans and animals proliferate in Copco reservoir along the Klamath River.

Top: Slab Creek Dam reduces flows to a trickle on an eight-mile stretch of the Upper American River.

Middle: Spawning salmon are denied upstream access by the Coleman Hatchery Weir on Battle Creek.

Bottom: Wildly fluctuating flow releases from dams are dangerous for people and adversely affect recreational opportunities.

Dams Impact Recreational Values

Low river flows generally reduce recreational opportunities, harming local tourism-based economies and personal enjoyment of a public resource. Some hydropower dams block public access to rivers altogether and eliminate opportunities to boat or fish.

The Truth about Hydropower

Truth: Water is a renewable resource but a healthy river is not.

Although water is replenished naturally, hydropower dams and their operations commonly harm rivers in ways that are detrimental and difficult to reverse. Dams often violate water quality standards and cut off water — sometimes entirely — from reaching its natural stream bed. Dams block the natural passage of sediment and debris and store organic materials in slack water reservoirs, which can create algal blooms and concentrate pollutants. In addition, small hydropower projects are not necessarily a “greener” energy source: these ecological impacts can be caused by any type of hydropower project, regardless of its size.



TIM PALMER

Truth: Dam modernization has little impact on overall energy production.

A study conducted by the Federal Energy Regulatory Commission (FERC) in 2001 found that new licenses for over 240 projects issued from 1986 to 2001 resulted in only a 1.6 percent average decrease in each hydropower project’s energy capacity.



PG&E

Truth: The negligible amount of energy lost by dam modernization can generally be replaced by new energy technologies.

New sources of power continually come on line to replace aging, less productive facilities. The market is flexible enough to absorb the removal of high-impact, low-energy value hydropower facilities without registering a significant loss on the grid. If the energy lost is significant enough to merit replacement, utilities have an ever-expanding array of alternative energy technologies from which to choose.



FILE PHOTO

Truth: Dam owners turn huge profits on generating hydroelectricity.

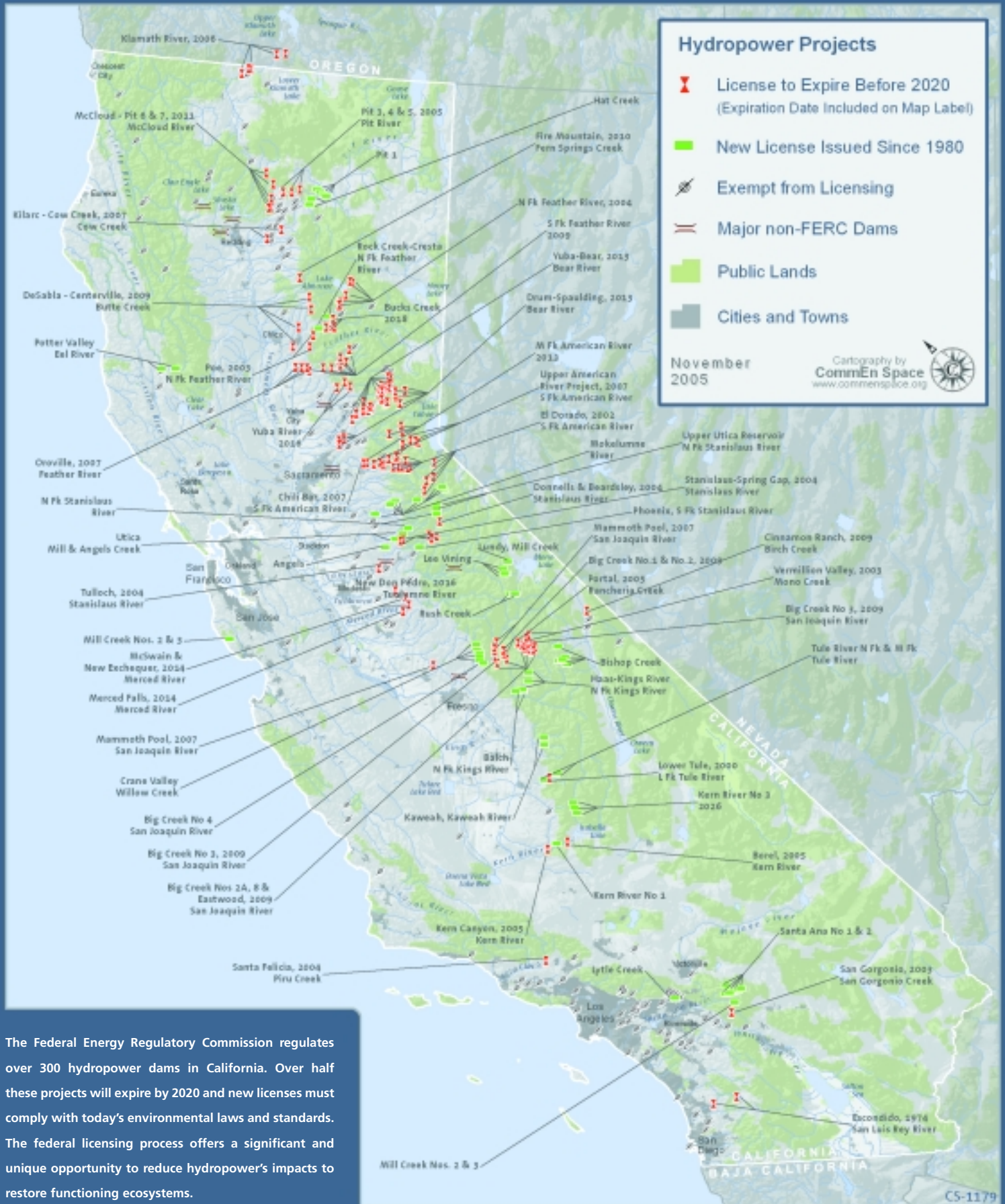
While other energy sectors must pay high prices for raw materials, hydropower operators turn a profit on a virtually free resource: the public’s water. Licenses last for a minimum of 30 years, making it possible to recoup investments in upgrades and turn a profit during the license term.

Top: A pristine river once ran through Donnell’s Reservoir on the Middle Fork of the Stanislaus River.

Middle: The Caribou Powerhouse is part of the Upper North Fork Feather River Project.

Bottom: Solar power is becoming an increasingly available, clean energy source in California.

California Hydropower Project Licenses Expiring from 2005 to 2020



The Federal Energy Regulatory Commission regulates over 300 hydropower dams in California. Over half these projects will expire by 2020 and new licenses must comply with today's environmental laws and standards. The federal licensing process offers a significant and unique opportunity to reduce hydropower's impacts to restore functioning ecosystems.

RESTORING RIVERS through the FERC LICENSING PROCESS

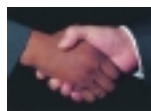
IN THE next 15 years, approximately 25 California hydropower projects — over 150 dams — will need to obtain a new operating license. The licensing process provides a unique opportunity for a wide variety of stakeholders — utilities, state and federal resource agencies, tribes, irrigators, conservationists and recreationists — to agree upon new license conditions that protect fish and wildlife, improve water quality and provide increased opportunities for public recreation.

Environmental Goals for Hydropower Reform

Rivers are a public resource — they are owned by all. Today, the ability to generate electricity must be evaluated alongside all demands for water including the environment, recreation and water supply. A hydropower license can essentially be viewed as a rental agreement for the next 30 to 50 years. Typical improvements to hydropower operations can achieve:

- Higher instream flows
- Flow release schedules that mimic seasonal flow cycles
- Enhanced habitat for fish and wildlife
- Improved water temperatures
- Upstream and downstream fish passage
- Increased recreational opportunities and public access to rivers

Settlements — the Basis for New Licenses



The time, cost and effort stakeholders devote to the licensing process are strong incentives to work together and agree upon license conditions that meet the needs of all parties. Collaboration tends to prevent or reduce the frequency and severity of disputes about the dam owner's final license.

Although a settlement may occur any time prior to FERC's issuance of a final license, it's a good idea to begin negotiating as soon as possible. Generally, if FERC determines a settlement is supported by substantial evidence and meets the requirements for a license, it will approve the settlement and incorporate the agreement's provisions as license articles.



VIVIAN PARKER



HOTSHOT IMAGING



BILL LACOMMARE



BILL LACOMMARE

Top: A young angler enjoys the Upper Sacramento River at Mossbrae Falls.

2nd: Recreational flows on the South Fork American River provide summer fun for thousands of users each season.

3rd: Hat Creek, a pristine tributary to the Pit River.

Bottom: Healthy fisheries stimulate healthy economic growth.

Major Players in the Licensing Process



Federal Energy Regulatory Commission (FERC)

FERC regulates all non-federal dams that generate electricity anywhere in the U.S. The Federal Power Act requires FERC to give “equal consideration” to power and non-power uses of the river. The licensing process takes a minimum of five years and the resulting license will govern project operations for the next 30 to 50 years.



Dam Owners

When a hydropower dam approaches license expiration, it is the owner’s responsibility to work with FERC and other stakeholders to ensure proper information is available. Based upon this information, a decision is made to determine how the project should be operated for the life of the new license.



State and Federal Agencies

Under the Federal Power Act, FERC is required to receive comments and incorporate conditions from state and federal agencies related to their authority to protect fish and wildlife or federal lands affected by the project. Depending on the agency’s authority, conditions for the new license can be recommendations to FERC or mandatory requirements.



Agencies commonly involved in the licensing process include the U.S. Fish and Wildlife Service, National Marine Fisheries Service (NOAA fisheries), California Department of Fish and Game, U.S. Forest Service, Bureau of Land Management, Bureau of Indian Affairs, the National Parks Service and the State Water Resources Control Board (SWRCB). The Clean Water Act authorizes the SWRCB to issue a water quality certification for each project that addresses how the project impacts water temperature, dissolved oxygen, and turbidity. FERC cannot issue a license without a water quality certification or a waiver from the SWRCB.



Native American Tribes

The Federal Power Act requires FERC to solicit and consider recommendations made by Native American tribes affected by the hydropower project. Additionally, projects located on tribal reservations may only be granted a license if they do not interfere or are consistent with the purpose for which the reservation exists. FERC designates a Tribal Liaison to work with tribes in government-to-government consultations.



The Public

Because FERC must give equal consideration to both power and non-power uses of the river, the licensing process offers a meaningful opportunity for members of the public, including non-governmental organizations, to participate. Local stakeholders bring an intimate understanding of project impacts to the licensing process and provide valuable insight into the management of future operations.



THE LICENSING PROCESS

YEAR 1 (5 years prior to license expiration)

The dam owner sends FERC a notice of "intent to file" a new license and a Pre-Application Document (PAD) containing all existing and relevant project information. The PAD also contains a proposed study plan. FERC will hold a public site visit and meeting that formally begins its scoping process for the environmental analysis.

The public may comment on the PAD, the draft study plan and FERC's scoping document, which will form the backbone of information that FERC will use to determine protection and enhancement measures for the new license. The public may also participate in the process to determine the final study plan.



YEARS 2-3

The dam owner conducts studies for at least two field seasons to gather information about the project's impact. One year into studies, the dam owner holds a public meeting to discuss study results and potential study plan modifications. The dam owner files a Preliminary Licensing Proposal.

The public has an opportunity to comment on studies and the Preliminary Licensing Proposal and request additional studies.



YEARS 3-4

The dam owner must file an application for a new license two years before the current one expires. FERC begins drafting the environmental analysis and agencies file preliminary recommendations, terms and conditions. At this time, all stakeholders have the opportunity to request trial-type hearings to dispute issues of material fact and propose alternatives to certain agency conditions.

Within 60 days of FERC's notice that the application is ready for environmental analysis, stakeholders should formally file for "intervenor status." The public may also comment on all FERC and agency filings including draft conditions and the draft environmental analysis.



YEARS 4-5

FERC completes its environmental review and agencies submit final resource recommendations. Mandatory conditions from authorized agencies are incorporated into the final FERC analysis. FERC issues or denies the license.

The public may comment on all draft and final documents. All formal intervenors can protest the final license.

MISSION ACCOMPLISHED

California River Restoration Successes



MAUREEN ROSE

Feather River

Significant hydropower development on the North Fork Feather has earned it the nickname “the stairway of power.” Pacific Gas and Electric Company’s (PG&E) two-dam Rock Creek-Cresta project controls over 20 river miles.

Agreement signed: 2000

- Increased base flows to improve habitat and enhance overall river health
- Modified flows to mimic natural fluctuations
- Established summer and fall whitewater recreation opportunities
- Conserved 2,300 acres in Humbug Valley from development and overgrazing



STEVE EVANS

Mokelumne River

The Mokelumne River’s dramatic drop from the peaks of the Sierra Nevada through Sierra Gold Country is harnessed by PG&E’s 19-dam hydropower project. A CHRC-led collaborative broke a 26-year negotiation deadlock with a settlement that set a precedent for successful collaborative licensing agreements in California.

Agreement signed: 2001

- Removed and/or breached three dams on tributaries
- Increased base flows to improve habitat and enhance overall river health
- Modified flows to mimic natural fluctuations



BILL LACOMMARE

Pit River

The Pit’s naturally high, cold flows make it one of the finest wild trout fisheries in the state. PG&E’s 4-dam Pit River project controls flows in the lower 22 miles.

Agreement signed: 2003

- Increased base flows to improve habitat and enhance overall river health
- Modified flows to mimic natural fluctuations
- Created a monitoring and restoration fund for the Pit and tributary Hat Creek
- Established whitewater recreation opportunities below Pit 5 Dam



FRIENDS OF THE RIVER

Stanislaus River

The Middle Fork Stanislaus River is home to a state recognized wild trout fishery and the South Fork is a recreational destination for countless Californians. PG&E and Tri-Dam own three projects — seven dams — above New Melones Dam.

Agreement signed: 2004

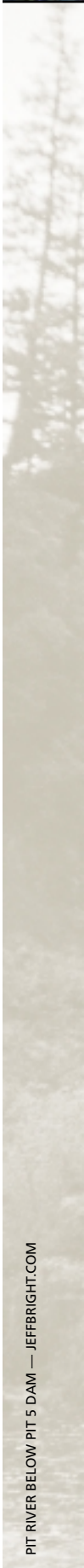
- Increased base flows to improve habitat and enhance overall river health
- Modified flows to mimic natural fluctuations
- Removed an abandoned dam to create fish passage
- Improved recreational flows and access sites
- Installed a fish screen to prevent entrainment
- Established a mitigation fund to restore riparian vegetation

Top: The license for the Rock Creek-Cresta project more than tripled the previous minimum flow requirement for this stretch of the North Fork Feather River.

2nd: The West Panther Creek Dam on the Mokelumne River is removed as a result of the relicensing settlement.

3rd: Increased flows will boost the Pit River’s world class fishing opportunities.

Bottom: The Stanislaus River Canyon.



PIT RIVER BELOW PIT 5 DAM — JEFFBRIGHT.COM

Members of the California Hydropower Reform Coalition

Steering Committee

American Rivers www.americanrivers.org
American Whitewater www.americanwhitewater.org
California Outdoors www.caloutdoors.org
California Sportfishing Protection Alliance
California Trout www.caltrout.org
Foothill Conservancy www.foothillconservancy.org
Friends of the River www.friendsoftheriver.org
Natural Heritage Institute www.n-h-i.org
Trout Unlimited www.tu.org

General Members

California Save Our Streams Council	Kernville Chamber of Commerce
California Wild Heritage Campaign	Mono Lake Committees
Central Sierra Environmental Resource Center	Mountain Meadows Conservancy
Center for Sierra Nevada Conservation	Northern California Council, Federation of Fly Fishers
Chico Paddlers	Pacific Rivers Council
The Conservation Fund	Planning and Conservation League
Friends of Butte Creek	San Joaquin Paddlers
Friends of the Eel River	Sequoia Paddling Club
Friends of the Tule River	Shasta Paddlers
Kern River Alliance	Sierra Nevada Alliance
Kern Valley Community Consensus Council	South Yuba River Citizen's League
Kern Valley Council	Tuolumne River Preservation Trust

Resources

- Visit the CHRC website for more information about California projects undergoing the licensing process:
www.calhrc.org
- Download the Hydropower Reform Coalition's *Hydro Guide* for a step-by-step analysis of the licensing process including strategy tips:
www.hydroreform.org
- Download a copy of FERC's *Relicensing Handbook*:
www.ferc.gov



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