The South Yuba

A Wild and Scenic River Report

This report was written and produced for the South Yuba River Citizens League by Tim Palmer and Ann Vileisis

March, 1993
The South Yuba River Citizens League is a citizen-based educational organization formed in 1983 by concerned community members. The organization’s mission is to preserve and protect the Yuba River ecosystem. This is being achieved through involvement in national, state, and local planning efforts of organizations and government agencies. SYRCL has 1,200 members and 4,400 supporters with an office and full-time staff. The group was instrumental in defeating two ill-conceived hydroelectric projects and in expanding the South Yuba River State Park Project.

For information or to offer support, contact SYRCL, P.O. Box 841, Nevada City, CA 95959, (916) 265-5961.

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Greatly appreciated financial support for this report was received from the following:

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Maps and graphics assistance are by Arts Arrived
Cover photo by Tim Palmer, South Yuba River
Here's What People say about the South Yuba River:

The South Yuba River is to western Nevada County as the cable cars are to San Franciscans. We want to see the South Yuba remain free-flowing, without dams that would turn the river into a trickle.

—Coldwell Banker, Grass Roots Realty
Grass Valley, CA

The South Yuba is a spectacularly beautiful river: clear water, white granite boulders, abundant wildflowers, and wildlife. It is used for all sorts of recreational pursuits, such as hiking, fishing, swimming, and kayaking. We would be greatly saddened if this river is ruined by another dam. We want our children to be able to enjoy one of the few wild places left in California.

—Janna Caughron,
Truckee, CA

I have lived in Nevada County since 1970. The South Yuba is the place I go with my family and friends almost every weekend in the summer to swim, relax, and unwind from the cares and concerns of the work world.

—Margery Williams,
Nevada City, CA
At the end of the day or on weekends, I often unwind by walking along the South Yuba River. I sit on its beautiful granite rocks watching birds and insects hover over the rushing water, or swim in its emerald ponds. It is quiet there even when there are people around. The river is one important reason I moved to this area over twenty years ago. I know it influenced many other people to move here too. There are few wonderful places like this left in the world, and I want and need it to remain a sanctuary in this busy world for me, my family, and my grandchildren.

—Barbara Brown,
Nevada City, CA

The stretch of river we are trying to protect has absolutely no development, is completely wild, and is used for swimming, sunbathing, fishing, and recreation only. It is really the heart and soul of this community. I think that anybody who has seen the river is immediately enchanted by its beauty.

—Haines Ely, M.D.,
Grass Valley, CA

I am a construction worker. When the temperature climbs into the 90s and above, I and many of my fellow workers structure our work days to allow for a few hours break, during the hottest part of the day, to take off to the river, and then resume our construction projects later. At all seasons the South Yuba river serves many people, as a retreat from our busy lives.

—Chamba Lane,
Nevada City, CA
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South Yuba River Location
Free flowing for 40 miles, the South Yuba River offers a wealth of natural qualities. This site above Purdon crossing compares with many of the finest Sierra Nevada rivers.
Introduction to a Valued Yet Threatened River

With crystal clear runoff at Donner Pass, the South Yuba River begins its cascading and tumbling descent of the Sierra Nevada. For much of its 64 mile length, this river of northeastern California exhibits many of the finer qualities of a mountain-and-canyon waterway.

Flowing almost entirely within Nevada County, the South Yuba traverses many ecological zones of the high Sierra, capped by volcanic monoliths and granite. It flows through old growth forests of pine and fir with the increasingly scarce habitat they provide, and it plunges through incised canyons of middle mountain elevations. Then it cuts a deeply carved course between 1,200 foot high flanks of the Sierra foothills, blanketed by chaparral and steep slopes bursting with wildflowers in springtime.

Over half of the river corridor is public land managed by the National Forest Service, Bureau of Land Management, and California Department of Parks and Recreation as a state park project.

Travelers on Interstate 80—the major east-west highway route of the northern United States—have an opportunity to see this river as they follow the route of California’s early settlers who labored westward on the Emigrant Trail above the banks of the South Yuba. Below that headwaters reach, the river remains a remote and wild watercourse. Just six bridges in 40 miles provide access without destroying the wild and natural flavor of the exquisite sections of unroaded river that lie between the crossings.

At the same time, the South Yuba is a hard working river. Spaulding Dam, 275 feet high and built in 1913, lies one-third the distance down from the headwaters and is operated by Pacific Gas and Electric Company for hydroelectric power. Water supplies are
also drawn from the reservoir and diverted southward by the Nevada Irrigation District for communities including Grass Valley. At the lower end of the South Yuba sits the 260-foot-high Englebright Dam built by the Army Corps of Engineers in 1938 for control of silt debris resulting from gold mining. The 10-mile-long reservoir is used for recreation and power production. Eighteen other substantial dams are located in the Yuba River basin, including New Bullards Bar on the North Yuba—the eighth largest reservoir in the Sierra Nevada—owned and operated by the Yuba County Water Agency.

Though wildness prevails along much of the waterway, the South Yuba is first of all a people’s river, attracting more than half a million visitors each year to its translucent, blue-green swimming holes and rock gardens of gleaming boulders. On hot summer days, residents of local communities and visitors from Marysville, Sacramento, and the San Francisco Bay Area flock there for swimming, picnicking, and hiking along the cool water’s edge. Residents along the river, especially in the Washington area, take pleasure in their waterfront. Experienced river runners consider the South Yuba among the most scenic whitewater rivers in California, and some sections are among the most challenging. The river offers undeveloped canyons, scenic shorelines, challenging whitewater, popular recreation sites, historic landmarks, and habitat for native fish, plants, and wildlife.

Historically, the South Yuba sustained a rich culture of Native Americans, followed by the domination of gold miners. Including its main stem, the Yuba River basin was the most heavily mined basin in the Sierra Nevada. Scattered dredging and recreational panning continue and some scars and relics remain, but the passage of time has largely restored the river from the mining activity of the past. This stream is one of the nation’s outstanding examples of a river that has recovered from historic abuse.

The South Yuba ranks as one of the more important natural river resources in the Golden State and near the top of the list of valuable yet still unprotected streams. Lying between the Middle Fork of the Feather and the North Fork of the American—both safeguarded as members of the National Wild and Scenic Rivers System—the South Yuba possesses many of the qualities of
those prestigious streams. But beyond that, the Yuba is more accessible.

Perhaps most importantly, the South Yuba is the centerpiece of a new state park project. Stretching for 21 miles from the river’s mouth upstream to Tahoe National Forest lands, the South Yuba is California’s finest example of a river-centered state park, designated and managed for recreation and ecosystem protection to benefit all the state’s residents.

Likewise, the South Yuba is significant from a nationwide perspective. Few other streams—even in the National Wild and Scenic Rivers System—offer the year-round recreation suitability of this river, especially with its clear pools and cascading rock slides, its good weather and picnicking and hiking opportunities so close to so many people—8 million within a four hour drive. The river stands as a model of resource recovery, and its scenic values compare with many of America’s finest rivers.

Only 2 percent of the nation’s rivers retain qualities necessary for Wild and Scenic River designation. The South Yuba, found eligible by both the Forest Service and the Bureau of Land Management, is clearly in this group. While whitewater accounts for only 1 percent of the remaining free-flowing river miles in America, virtually the entire length of the South Yuba falls into this category of rapids and steep gradient. Habitat for rare or endangered species—scarce nationwide—can be found here. Riparian or riverfront habitat, reduced to 10 percent of its past extent in California, survives in reclaimed form along the South Yuba.

In spite of the dams and diversions that already tap this river, the South Yuba has been proposed for additional development. Two small hydroelectric projects received licenses from the Federal Energy Regulatory Commission (FERC) in spite of local and state government objections. The projects have not been built because of widespread opposition and economic unsuitability. One of these dams and diversions would have resulted in condemnation of state park land by private developers. No power would have been produced in summer months, when California needs electricity the most. Both projects—Miner’s Tunnel and Excelsior—are inactive in 1993 but could be revitalized at any time.
Affecting a much larger reach of river and threatening to flood public land in both the Tahoe National Forest and South Yuba State Park Project are dam proposals by the Yuba County Water Agency. This public entity is headquartered in Yuba County, on the main stem of the Yuba River, in the Central Valley of California downstream from the South Yuba confluence.

Though the Army Corps of Engineers found all dam sites to be economically unfeasible, engineers hired by the Yuba County Water Agency recommended that the Agency fund "prefeasibility" studies. A dam of either 400 or 450 feet would be built, flooding 10 miles of the pristine river and diverting flows away from an additional 19 miles of the South Yuba, including all of the State Park reach. The most optimistic prospects for flood control or water supply from these projects are nominal at best, as pointed out in Part 2 of this report. The costs and impacts are manifold.

While saving the finest remaining values of this river, there is no need to neglect flood control and water supply for Yuba County or other areas that require help. The South Yuba River Citizens League believes that people's needs for water, power, and flood control must be met. However, research by various government agencies clearly indicates that alternatives to new dams on the South Yuba can serve the public's needs at far less cost to water users, to local and downriver residents, to the environment, and to government at the local, state, and national levels.

Because of the South Yuba's outstanding natural qualities, and because of the recurrent threats to the waterway and its canyons, the South Yuba River Citizens League has prepared this report as a source of information for all people concerned with the river's future.

Following a summary of the report, information is presented in three sections: 1) documentation of existing qualities and features, 2) presentation and analysis of new dam proposals that conflict with river values as they exist, and 3) discussion and recommendation regarding National Wild and Scenic River designation of the South Yuba—federal action that would preclude new dams and enhance the recreational and economic value of the river to Nevada County and to all of California.
While the position of the Citizens League is clearly one of protecting the river as it currently exists and sustaining the traditional values that the river has offered to people for generations, the authors have also addressed the proposals that would alter the river for other purposes. The arguments for doing so are presented here as they have been presented in documents prepared by the water project sponsors. That section of the report also includes analysis of the proposals by the Citizens League and by various local, state, and federal agencies.

It is hoped that this report will illuminate the choices that exist for the South Yuba, and that the information will better enable decision makers to act wisely regarding the future of this exceptional place.

Unlike the effects of gold mining, which altered the river so dramatically a century ago but which now remain only as relics of a bygone era, the current proposals for damming the South Yuba River would last forever. If such proposals are pursued, it should be with full knowledge of the costs—fiscal, social, and environmental—to local residents, to California, to the nation, and to the ecosystems that sustain us all. The impending decisions are perhaps the most important that have ever been faced regarding the Yuba River and its people.
The South Yuba is well-loved and well-used by local residents and visitors alike. This person is enjoying the river upstream from Highway 49.
Summary

After considering a wealth of information, this report concludes that the South Yuba River, as it exists, offers outstanding values to people at the local, state, and national levels. The river is threatened by proposals that could destroy its qualities, yet the threatening projects are not feasible, economically sound, or desirable, and alternatives to those developments can far more effectively serve people’s needs. Designation of the South Yuba as a National Wild and Scenic River would benefit landowners and the public at large, would be inexpensive, and would assure that the values of the river and the property alongside it are retained for this and future generations.

This report investigates all of these concerns in detail. Highlights of the findings, focusing on the Spaulding Dam to Englebright Reservoir reach, are listed below.

Summary- Part 1  The Qualities of the South Yuba River

The river offers exceptional recreation areas for swimming, hiking, and picnicking along a clear-water river with rapids, beaches, and boulders, and is only four hours away from eight million people.

Recreation use totals about 671,000 visitor days per year, infusing many millions of dollars into the local economy and contributing to hundreds of jobs. The river is prized by local residents as a place for recreation and relaxation. Many people visit the river regularly and at all times of the year.
The South Yuba is unique in the Sierra Nevada and in California because it remains free-flowing between the elevations of 4,700 and 527 feet above sea level. This reach includes the middle and lower elevations of the Sierra that are elsewhere dammed and developed. Only one other river is free-flowing within this “window” of elevation, and it is mostly in private ownership.

Over half the river corridor is publicly owned and managed for recreational use.

When completed, the South Yuba River State Park Project will be the finest example of a river corridor park in the entire California state parks system and one of the exemplary river parks in the nation.

Important fish, wildlife, and plantlife can be found. The endangered bald eagle and the California spotted owl use the canyons. Vital deer range and deer migration routes are also found there. The South Yuba’s uncontrolled flows are necessary for salmon and other fish in the lower Yuba and Feather rivers.

Though access is provided at six bridge crossings, roads do not parallel the river for most of its length, leaving it largely wild and undeveloped, yet approachable at the bridges and by trails, including a nationally-known trail accessible to disabled people. Year-round hiking is available because of the river’s mild climate.

Fishing can be very good in remote areas. The whitewater boating run from Washington to Edwards crossing is considered one of the finest one-day wilderness runs in the state, and sections below Edwards crossing offer some of California’s most challenging rapids.

Geologic values of the river are outstanding, owing to the structures that resulted in gold deposits. Historic values are important, and scenery is superlative in this canyon that has reclaimed itself from past mining abuse.
Summary - Part 2 Water Projects and Proposals

The South Yuba is already heavily used for irrigation, municipal supply, and hydroelectricity; existing projects offer flood control benefits as well.

Small hydroelectric proposals once planned at Miner’s Tunnel and Excelsior have been abandoned, owing to economic problems and local opposition. Developers could propose projects at the sites again in the future.

Large dams have been identified as “buildable” by engineering consultants hired by the Yuba County Water Agency (YCWA). Yuba County lies downstream from the South Yuba River.

Flood Control Considerations

New dam proposals on the South Yuba are not important for flood control for the following reasons.

The Army Corps of Engineers has found the dams to be unworthy of consideration. Studies by various agencies in the past came to the same conclusion.

The volume of flood flows emanating from the South Yuba are very small—10 percent of the flood flows in the Marysville area, including Linda and Olivehurst—the only area where flood protection is needed.

In 1986, floods in the communities of Linda and Olivehurst were caused by failures in sections of levees that had not been upgraded during levee repairs. The Yuba River was flowing at only 65 percent of the design capacity of the levee when it broke.

Claims of flood protection provided by the proposed new dams are fatally flawed because the assertions depend on flood
crop is rice, which accounts for 32 percent of the irrigated land in the area and is frequently in surplus, meaning that the government pays farmers to curtail production.

Water efficiency measures could provide the YCWA with far more water at far less expense than by building new dams. If the water from a South Yuba dam were used locally, prices would have to be raised sharply to pay for the dam.

Water rights for South Yuba dams are unlikely ever to be awarded because of requirements that the sponsor show needs based on reasonable and beneficial use. The YCWA’s own engineering report stated that “because of existing upstream water rights on the South Yuba River, it is unlikely that a firm water supply could be developed.”

If water supply ever becomes a problem, New Bullards Bar Reservoir could solve it. The YCWA’s engineering report stated that “remarkable improvement in both amount of power generated and severity of water shortages would be achieved with a minor modification of operating rules for the New Bullards Bar Reservoir.”

**Nevada County Considerations**

Nearly the entire South Yuba River lies in Nevada County. Water supply from the basin is tapped from above Spaulding Dam. The river between Spaulding and Englebright is extremely popular among local people for recreation, and the river has drawn impressive political support when threatened in the past.

Nevada County has no need for flood control on the South Yuba River.

Nevada County has no need for water supply from the South Yuba below Spaulding. Even if storage instantly materialized there, the water would require prohibitively expensive pumping to bring it up to a usable elevation.
There is not, nor will there be, any need or justification to develop the South Yuba for water supply to San Juan Ridge. Zoning there restricts development to very large parcel sizes, inappropriate for expensive public water systems, and residents have expressed a strong desire to keep the low density character of the area.

Existing water supplies are regarded by the Nevada Irrigation District (NID) as adequate for local use in the long-term future. If new supplies are someday needed, they will logically be taken from facilities above Spaulding.

In 1993, temporary state requirements were enacted for releases of water from the NID and other Sacramento River water providers to remedy downstream flow problems in the Delta caused by the cumulative water projects in the basin. NID officials expressed concern that these requirements could mean additional water needs after the year 2010, and suggested that a group of water agencies might together develop new dams. The Delta regulations, however, are temporary. Even with these requirements, water efficiency improvements could extend Nevada County supplies into the future. If the South Yuba dams were developed by the YCWA with an agreement to satisfy NID Delta requirements, the total yield of the dams in the dry years of 1976-77 would be enough to equal just 70 percent of only NID's obligation for water to be released to the Delta. And it is inconceivable that the YCWA would build the dams only for NID use. It is also inconceivable that NID would undertake a project requiring over half a billion dollars for such an insignificant amount of water that might never be needed. Furthermore, damming the South Yuba again would be counterproductive to the Delta needs, as the existing, uncontrolled flows deliver water in the springtime, when it is needed. New dams would hinder—not help this situation.
Impact of the Dams

Proposed South Yuba dams would flood 10 or more miles of spectacular canyon and river, and would dewater at least 19 miles below the dams, all of which is in the South Yuba River State Park Project. Effects on recreation, wildlife, plantlife, fisheries, and historic sites would be severe. State Park, National Forest, Bureau of Land Management, and private lands would be flooded. The local economy, increasingly dependent on recreation and tourism, would be undercut.

The springtime high water of the South Yuba would be diverted to New Bullards Bar Reservoir for storage, severely aggravating already existing problems of salmon and downstream fisheries in the lower Yuba and Feather rivers.

Cost and Efficiency

The YCWA engineering consultants estimated that the two proposed South Yuba dams would cost $225 and $262 million, respectively. This amount excluded interest. Interest of 8 percent would double the cost of the project in only nine years. Total costs would be far greater. An environmental mitigation allowance of $2 or $3 million is an underestimation, as no environmental assessment was done, and a simple study of environmental impacts may cost that much.

The proposals are remarkably inefficient as dam sites, creating very small reservoirs given the height of the dams, and the small amounts of containable flood water and storable water supply. The YCWA would have to pay for the projects without federal participation, owing to the Army Corps of Engineers’ finding that the sites are not economically feasible. A small county, where personal income ranks third from the lowest in the state, cannot likely afford a half-billion dollar dam of inconsequential usability. The YCWA administrator stated that the agency would not pursue the dam proposals without federal participation.
Hydroelectric revenues from the projects would be small and are overestimated because they include improved revenues for existing power facilities.

If the YCWA pursues a South Yuba dam site, it would face a gamut of insurmountable obstacles. Bond sales for an uneconomic project would be needed as well as environmental impact statements, water rights, Section 401 and 404 compliance with the Clean Water Act, approval to further diminish salmon fisheries, Endangered Species Act exemptions, Nevada County approval, agreement of the Forest Service and Bureau of Land Management, and condemnation of State Park and private lands.

Virtually no large dam proposals have been approved anywhere in the nation in the past twelve years, and these South Yuba sites are perhaps the least feasible of any projects that have come up for serious consideration.

Summary-Part 3 National Wild and Scenic River Designation

National Wild and Scenic designation of the South Yuba would provide the best means available under law to keep the river the way it is.

New dams and water projects within the designated reach would be prohibited. Existing water projects and diversions would be unaffected.

Private land would not be condemned; in fact, the designation would protect landowners from water projects and other threats.

Absolutely no federal regulation of private lands would result. Private lands would continue to be regulated by county zoning, as it is now.
Timber management on federal land might be slightly modified to protect the riparian and scenic corridor, but logging is already tightly regulated. Private logging would continue to be governed by the State Forest Management Act.

Hunting and fishing would continue to be regulated by the state as they are now.

Existing mining would be unaffected.

The federal government might improve protection of some existing open space by acquiring lands from willing sellers only. This would give landowners the opportunity to sell acreage for open space protection, but in no event would it require them to do so.

The ability of federal agencies to effectively manage recreation on public lands would improve.

The designation would cost very little. Possible expenses could be for eventual acquisition of lands bought from willing sellers, and for minor funding to improve recreation management.

The river has been found eligible for wild and scenic designation by the Forest Service and Bureau of Land Management.

The river is suitable for designation because of the following findings: Over half the land is in public ownership, and there are no major land-development threats or potential. Commercial timber on National Forest land is already under restricted management. The proposed water projects are neither practical nor economically feasible. No water projects are proposed for licensing or even for feasibility studies. The Yuba County Water Agency is not pursuing the dam projects and is not spending money on them. Widespread public support exists for protection of the river, and the costs of protection are small.
Recommendation

The South Yuba River Citizens League recommends National Wild and Scenic River designation of the South Yuba River from Lang crossing to Englebright Reservoir. Only National River designation will adequately address the needs for protection in the long term. This can be done without disrupting existing uses of the river corridor. By protecting this outstanding river, its qualities can remain for the use and enjoyment of landowners as well as visitors from local counties, the state, and the nation. The League believes that protection of the South Yuba River offers the best future for everyone.
Some of America's heaviest snowfalls blanket the headwaters of the South Yuba near Donner Pass, a major winter recreation destination. The river then drops through many ecological zones of the Sierra Nevada.
Part 1  The Qualities of the South Yuba River

A Survey of the River

Castle Peak, just north of Donner Pass, towers over the headwaters of the South Yuba River. Rising to 9,103 feet above sea level, the mountain's slopes are often clad in snow for eight months of the year. This volcanic monolith, named for its sheer and fluted western face, ranks as the second highest peak north of Lake Tahoe in California's Sierra Nevada. Only Mount Lola, at 9,143 feet and draining into the South Yuba tributary of Fordyce Creek, rises higher.

The source of the South Yuba is Lake Angela at 7,190 feet, blocked by a small dam just north of Donner Pass. Fed by some of the heaviest snowpacks of Sierra Nevada and centered in one of the areas of highest snowfall in America, the South Yuba headwaters wind westward, crowded for several miles by Highway 40, which was the major road over the Sierra before Interstate 80 was built. The Southern Pacific, following the route of the first transcontinental railroad, also parallels the river's path.

The river enters the bed of the former mile-long Van Norden Reservoir, where a dam was built in the 1870s but abandoned a century later. The river then winds through meadows that are reclaiming the old reservoir site, and flows over the remaining face of the breached dam near the community of Soda Springs. This upper reach of the South Yuba flows past one of the greater concentrations of ski resorts in California, including Sierra Ski Ranch, Sugarbowl, Soda Springs, Boreal Ridge, and Royal Gorge.
The South Yuba flows through a spectacular granite gorge downstream from Lang crossing. This is the "Emerald Pools" section of the river.

For 12 miles below the community of Norden, Interstate 80 parallels the South Yuba, crossing it three times. Forest Service recreation sites lie along the bouldered stream crowded by pines and fir. Waterfalls plunge over granite outcrops. Rustic vacation cabins lie scattered along the route. The river then enters the two-mile long Spaulding Reservoir.

Spaulding Dam lies 24 miles down from the river's Donner Pass source and blocks the South Yuba's flow in a spectacular granite gorge. Diversion canals lead southward from the reservoir to the Deer Creek and Bear River basins. In the first mile below Spaulding, remains of a ten-foot-high concrete dam can be seen; the short pool behind it is now totally filled with silt.

For 2 miles below the dam, the South Yuba cuts through a remarkable granite gorge with vertical cliffs rising 200 feet, with ten-foot waterfalls, and with green pools so deep that their bottoms cannot be seen in spite of crystal clear water. The Lang bridge crosses midway in this section, just above the most scenic part of
The river below Spaulding Dam is mostly undeveloped, except for six historic bridge crossings and the village of Washington. The Edwards crossing bridge provides access to trails and to favorite summer swimming holes.

For 5 miles below Lang crossing, the river bisects a wild canyon without roads, development, or trails, although hikers can scramble over the rocks. Steep slopes of granite, chaparral, oaks, and coniferous forest rise 2,000 feet above the water. Small tributaries immediately begin to add water to the South Yuba's flows, otherwise depleted by the Spaulding diversions except when the dam spills extra runoff. From the canyonsides, views of peaks near the Sierra crest are visible.

At 5 miles below Lang crossing, a four-wheel drive road appears on the north side; then a dirt road runs for 4.5 miles to the paved Washington Road, which crosses the river. Along this exceptionally scenic reach lie coniferous and oak forests, occasional cabins, and two Forest Service picnic areas. At
Throughout the South Yuba canyon, people find a variety of recreational opportunities. These boys are enjoying fishing on a hot summer day.

Holbrook Flat, a dam site has been considered by the Yuba County Water Agency.

Washington lies on the south side of the river and includes several dozen homes, a number restaurants and bars, a hotel, a store, and two commercial campgrounds. Occupied since 1850, this historic and picturesque mining community is the only development along the entire South Yuba below Spaulding. The town is reached by paved road from Highway 20, 7 miles to the south, and by dirt roads from the north.

Below Washington, the South Yuba flows through 13 miles of unroaded, undeveloped canyon with steep forested slopes rising 1,200 feet above the river. Groves of timber include Douglas fir, ponderosa pine, and live oak. Occasional rock outcrops form a jagged profile on slopes above the river. This is one of the finer sections of river in the middle elevations of the Sierra Nevada, with outstanding scenic, whitewater, and wildland qualities. Spectacular trails reach the river at several points, and the Forest Service plans to complete a trail paralleling the river for the entire reach.
The South Yuba is unusual in flowing without dams for 40 miles through the middle and lower elevations, providing for critical wildlife habitat and year-round recreation.
Humbug Creek, flowing from Malakoff Diggins State Park, 3 miles north of the river, is an outstanding wild tributary in its lower reaches cascading over waterfalls and through chutes and slots carved into granite bedrock. The proposed Humbug Dam site is 1.5 miles below the mouth of the creek.

Edwards crossing, 13 miles below Washington, is reached by a steep, winding, paved road from Nevada City to the south, and by a gravel road from the north. Below Edwards crossing, the canyon is only half a mile wide and rises 1,100 feet above the river on both sides. Hillsides of oak and chaparral become more common, especially on south facing slopes. Trails extend down both sides of the river from the historic iron truss bridge, and the trail on the south side continues 4 miles to Purdon crossing. Halfway between Edwards and Purdon crossings, Bald Mountain climbs to 1,325 feet above the river elevation and hosts a remarkable array of unusual plants and wildlife habitat.

At Purdon crossing, an unimproved dirt road crosses another historic iron truss bridge and provides access to deep swimming holes, small beaches, and steep rapids. Two miles downstream, the Devil’s Slide rises as a precipitous 1,000 foot slope on the south side of the river where the Excelsior Dam and diversion were proposed for hydroelectric power.

One mile farther downstream, Miner’s Tunnel—dug to divert water from the riverbed for a short distance—remains as a remnant of gold mining days and marks the site of another proposed low dam and diversion for hydroelectricity. This project was also dropped by the developer and is inactive.

Highway 49—the only major crossing of the South Yuba for 45 miles between Interstate 80 and Bridgeport—is a popular recreation site only 8 miles from Nevada City. Huge granite boulders, warm summer swimming holes, and isolated white-sand beaches highlight this extraordinary section of river. The Independence Trail, built for physically disabled people, parallels the river for several miles along the abandoned Excelsior Ditch, which clings to steep slopes on the south side of the river.

One mile below Highway 49, a four wheel drive road drops from the canyon rim to Jones Bar on the south shore. Downstream from there, the vegetation consists mostly of chaparral and oaks with only isolated pines or firs on shaded slopes.
The historic site of Bridgeport lies 7 miles below Highway 49. This is the major recreation area of the South Yuba River State Park Project; it has picnic facilities, a parking area, several trails, and interpretive displays. The Pleasant Valley Road crosses the South Yuba, and a historic covered bridge, now reserved for pedestrians, also crosses the river. This is the longest, single span, wooden, covered bridge in the United States.

From Bridgeport, a trail extends downriver to the confluence of the South Yuba and the Yuba’s main stem. This occurs in the backwaters of Englebright Dam, located on the main stem but flooding the South Yuba for half a mile above the confluence.

Geology of the South Yuba River Canyon

The South Yuba River flows from the western flank of the northern Sierra Nevada, a massive block of mountains extending nearly three-quarters the length of California. The spectacular mountains of the South Yuba headwaters are composed primarily of granitic rocks formed during the Jurassic period and volcanic rocks from the Miocene and Pliocene. These scenic landforms gained their current appearance more recently when glaciers scraped away debris and left behind smooth mounds of polished granite and slopes of crumbly scree.

As it flows westward from the granite-plated mountains, the river cuts a deep canyon in the middle and lower elevations, revealing the geologic history of this majestic range. The oldest rocks of the Sierra are exposed in the South Yuba canyon. Metamorphosed slates, schists, marbles, and quartzites found in the canyon today were once clays, sands, and limestones at the bottom of a Paleozoic sea 250-300 million years ago. One rare marine-fossil site from this era is located along the river.

High on the slopes of the South Yuba are the remains of an ancient river system that drained the ancestral Sierra 40 million years ago. Water from the ancient river eroded the mineral-rich mountains and carried enormous amounts of sediment west to an inland sea, now the Sacramento Valley. The voluminous sediments, which included gold-bearing gravels, were deposited in
The river reveals a variety of geologic features including these metamorphic outcroppings upstream from Edwards crossing.

broad flood plains in the area of the present-day South Yuba.

The presence of that ancient auriferous river influenced how the South Yuba looks today. Landscape alterations caused by nineteenth-century gold mining activities can still be seen in the canyon. For example, gravels removed by hydraulic mining have been redeposited at the mouths of some tributary streams and form banks up to 100 feet high.

In the river canyon, one can also see volcanic rocks formed during a period of intermittent volcanism. During the Miocene and Pliocene eras between 25 and 2 million years ago, volcanic ash and mudflows blanketed much of the mountain range. Subsequently, erosion removed most of the volcanic debris, but some still remains along ridges and as boulders fallen into the river and along its banks. Erosion also exposed granitic rocks, which can be seen in the riverbed as giant water-sculpted boulders.

The modern Sierra uplifted to its present height and tilted westward between 25 and 2 million years ago. As a result of this movement, the modern South Yuba flowed rapidly west, cutting its deep and incised canyon. Several faults formed in the western
foothills, including the Melones Fault that crosses the South Yuba just west of the town of Washington. The fault zone is recognized at the rivers edge because the highly fractured rock has been emplaced with serpentine, a green rock resembling jade.

The faults that crisscross the South Yuba are generally presumed to be inactive. However, sizable earthquakes have occurred in within the past century. Historic research indicates that three earthquakes registering between 5.0 and 6.0 on the Richter scale occurred between 1888 and 1909 in the Washington area (California Geology, August 1978). According to Department of Mines and Geology scientist Bill Bryant, structural conditions make it difficult to evaluate the present activity of faults in the Sierra foothills.

Hydrology of the South Yuba

Of all Sierra rivers, the Yuba River system, including the North, Middle, and South forks, is the third largest in volume, but the South Yuba contributes only 17 percent to that overall flow. While the entire Yuba system drains 1,350 square miles, the South Yuba drains only 343 square miles in Nevada County and a small portion of Placer County. The South Yuba is not regarded as a major water or flood producer.

The South Yuba’s average runoff before existing dams and diversions are taken into account is 691,000 acre-feet. But, according to U.S. Geological Survey (USGS) records from 1970 to 1991, actual runoff in the lower South Yuba is only 292,960 acre-feet because water is diverted from the basin at Spaulding Dam. For comparison, the average annual runoff below dams on the North Yuba is more than three times greater—1,071,000 acre-feet.

On the South Yuba, river gauges measure flows at Lang crossing, and at Jones Bar, just downstream from the Highway 49 crossing. Below Spaulding Dam, the minimum instream flow required by the dam’s license is 5 cubic feet per second (cfs). But during peak runoff when Sierra snows are melting, flows may be considerably higher. A table of average daily flows based on USGS records from 1970 to 1991 follows.
Average Daily Flows

<table>
<thead>
<tr>
<th>Gauge</th>
<th>February</th>
<th>July *</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lang Crossing</td>
<td>103 cfs</td>
<td>52.8 cfs</td>
</tr>
<tr>
<td>Jones Bar</td>
<td>742 cfs</td>
<td>125 cfs</td>
</tr>
</tbody>
</table>

* Especially high flows for two years skewed the daily averages. At Lang crossing in February, the flow is more typically 30 cfs or less. In July, the flow at Lang crossing is often 6 cfs.

Despite tremendous seasonal fluctuations, the South Yuba’s average annual flow at Jones Bar, based on long-term flow data, is 405 cfs.

From its headwaters up Lower Castle Creek (7,900 ft.), the South Yuba makes a 2,889-foot drop into Spaulding Reservoir (5,011 ft. pool height) and then a 4243-foot drop from below Spaulding Dam to Englebright Reservoir (527 ft. pool height).

![Graph of daily average flows 1970-1991]

Below Spaulding, the river's average gradient is approximately 106 feet per mile.

Except for siltation from historic hydraulic mining sites during peak runoff times, the South Yuba's water quality was rated "good" by the Regional Water Quality Control Board. The National Park Service also rated the South Yuba's water quality "good" in its Nationwide Rivers Inventory. Because the river corridor is largely undeveloped, there are no municipal or industrial sources of pollution. In the summertime, swimmers enjoy the South Yuba's deep pools, crystal-clear and blue-green at their greatest depths.

In the South Yuba watershed, warm, dry summers typically alternated with cool, wet winters. In the high country above 6,000 feet, average annual precipitation is an enormous 80 inches, mostly snow that forms the river’s spring flows. But overall precipitation is moderate, with most occurring between November and May. Near Edwards crossing, average annual precipitation is 50 inches, and at lower elevations precipitation is less.

**Plantlife of the South Yuba River Canyon**

From the wildflower meadows carpeting the slopes of Castle Peak to the sprawling oaks near Bridgeport, the South Yuba flows through a variety of plant communities that represent an excellent cross section of botanic life in the Sierra Nevada. Major plant zones are Arctic-Alpine (above timberline), Canadian (mixed conifer), Transition (conifer and hardwoods), and Upper Sonoran (chaparral).

In its uppermost reaches, the river meanders through gardens of granite, coniferous forests, and grassy meadows. In the Norden-Soda Springs area, the river flows through bogs, willow thickets, and forests of lodgepole pine before beginning its steep descent toward Spaulding Reservoir.

Below Spaulding, in the Lang crossing area, the South Yuba flows through a deep gorge where alder, broad-leaf maple, black cottonwood, red-osier dogwood, and aspen grow near the
river's edge. Under these riparian trees, which can be found along
the river's entire length, luxuriant foliage, including the large-
leafed Indian rhubarb, also bursts forth. Delicate hanging gardens
of ferns form where water seeps from vertical rock walls of the
river gorge. Atop the steep walls, Jeffrey pine, huckleberry oak,
and brush chinquapin grow amid mounds of smooth granite.

Five miles downstream from Lang crossing, the granite
outcroppings give way to forested slopes. On its way to
Washington, the river flows through mixed-coniferous forests
made up of ponderosa pine, sugar pine, Douglas fir, white fir, and
incense cedar. Large stands of canyon live oaks and black oaks
also grow on south-facing slopes. Although gold miners cut most
of the trees down over a century ago, pockets of old-growth remain
in the river corridor. While the areas are not large, Forest Service
botanist Kathy Van Zuuk says the old-growth “could be
ecologically significant” for wildlife dependent on the attributes of
old forests.

Below Washington, more oaks begin to blend with the
mixed conifers, especially on the warmer and drier south-facing
slopes. The result is a mixed hardwood-conifer forest that includes
California black oak, broad-leaf maple, canyon live oak, and
ponderosa pine. On the shady north-facing slopes, Douglas fir
grow. According to Sandy Harrison, resource ecologist for the
California Department of Parks and Recreation, “in the South
Yuba canyon, there is a very unique diversity of species relative to
other Sierra foothill rivers.”

One unique plant community grows atop Bald Mountain,
which forms the north rim of the canyon between Edwards and
Purdon crossings. Harrison called the area an “ecological island”
because it is composed of species not found elsewhere along the
South Yuba. Vegetation is similar to species found in pygmy
forests, such as Garry oak and McNabb cypress.

In the Washington and Edwards crossing areas, botanists
find serpentine-clay outcroppings, which are prized for their
propensity to produce unusual plant species, such as the pale
purple jewel flower (*Streptanthus tortuosus*).

Near Highway 49, the South Yuba's mixed hardwood
forest grades into oak woodlands and chaparral. The oak
communities include California black oak, blue oak, and interior
The South Yuba canyon houses a wide array of plantlife including old-growth conifers, oaks, and riparian species, such as these alders along the riverbank. Riparian habitat is one of the most critical types of habitat in California.

Live oak. Live oaks shed their small oval leaves only a few at a time, so they remain verdant year round.

Statewide oak populations—especially blue and valley oaks—are declining because of complex factors that prevent growth beyond the seedling stage. According to the Nevada County Environmental Inventory, local oaks are also experiencing decline in both number and regeneration. The oak populations within the South Yuba corridor represent a significant stronghold of these species and are a valuable source of food and shelter for wildlife in the county.

In the Bridgeport area, the river canyon opens up. Oaks and chaparral species, including manzanita, madrone, buckeye, toyon, California gray pine, and chamise grow in the rolling foothill terrain. In the springtime, open grassy fields host the blossoming of thousands of wildflowers.

Little inventory work on plants and animals has been conducted in the South Yuba River canyon. Because all sightings
of endangered and sensitive species have occurred close to roads, several experts agree that there is a high likelihood that other rare species inhabit the South Yuba corridor. According to Forest Service sensitive plant specialist Kathy Van Zuuk, the following sensitive plants have potential to be found within the South Yuba River corridor.

- Macfarlane (Fritillaria eastwoodiae)
- Mountain lady's slipper (Cypripedium montanum)
- Clustered lady's slipper (Cypripedium fasciculatum)
- California nutmeg (Torreya californica)
- California yew (Taxus brevifolia)
- Pleasant Valley tulip (Calochortus clavatus)
- California pitcher plant (Darlingtonia californica)
- Round-leafed sundew (Drosera rotundifolia)
- English sundew (Drosera anglica)
- Phacelia stebbinsii (Stebbins phacelia)
- Sawtoothed lewisia (Lewisia serrata)
- Short-petaled campion (Silene invisa)
- Scarlet huckleberry (Vaccinium coccinum)

The Cantelow's lewisia (Lewisia cantelowii) is another rare plant sighted in several places below Washington. With light pink flowers borne on a stalk rising from a basal rosette of fleshy leaves, the lewisia requires the moist outcroppings found in the South Yuba canyon. This species has federal category 3-C status and is a California species of special concern.

Terms Used to Describe Rare Species

The U.S. Fish and Wildlife Service and the federal Endangered Species Act use the term “endangered” to identify a species in danger of going extinct “throughout all or a significant portion of its range,” and “threatened” to identify a species “likely to become endangered within the foreseeable future.” Other federal categories indicate stages of candidacy for designation. The California Department of Fish and Game also uses the terms “endangered” and “threatened” to describe the status of species within the state. When there is not adequate information to confirm “threatened” and “endangered” designations, the Department also uses the phrase “species of special concern” to
identify plants and animals whose populations may be declining. "Sensitive" is a term used by the U.S. Forest Service to describe species that may be experiencing population decline on National Forest lands.

Wildlife in the South Yuba River Canyon

The South Yuba River corridor provides year-round habitat and migratory routes for the many mammals, birds, amphibians, and reptiles that make the river canyon their home. In general, riparian habitat accommodates a greater variety of wildlife than any other habitat type in California. According to J. Sorenson in *Proceedings of the California Riparian Systems Conference*, 25 percent of the state's mammals, 80 percent of amphibians, and 40 percent of reptiles depend on riparian zones. Unfortunately, riparian and other habitats are shrinking.

The state Department of Fish and Game (DFG) has identified a trend toward decline of habitat values in Nevada County, according to the *Nevada County Environmental Inventory*. As residential development in the county encroaches upon remaining wild areas, the South Yuba canyon remains a critical source of habitat for wildlife. Furthermore, given the continuing destruction and degradation of canyon habitats statewide, the U.S. Fish and Wildlife Service has reported that the significance of remaining canyon habitat has also greatly increased.

According to Dave Connell, Forest Service wildlife biologist, the South Yuba can be considered significant habitat because it is mostly free flowing and presents no barriers to migration for 40 miles through critical low and middle-elevation habitat. DFG wildlife biologist Jeff Finn concurs that the habitat afforded by the South Yuba is particularly significant to wildlife because it is large, mostly unbroken, uninhabited, and roadless.

Mammals

The most common large mammals in the South Yuba canyon are deer. Deer populations throughout Nevada County
have been characterized by both the DFG and the Tahoe National Forest as "unstable" and "declining." The decline is largely attributed to human encroachment on migratory routes and on winter range, especially in the western portion of the county.

According to Forest Service wildlife biologist Dave Connell, the black oak and live oak stands growing on south-facing slopes in the vicinity of Edwards crossing are critical winter range for the Nevada City deer herd. In these oak forests, which extend several miles upstream, the deer find acorns that make up a very important part of their winter diet. The DFG has also identified the oak woodlands adjacent to the river between Highway 49 and Malakoff Diggins State Park as critical winter range for both the Nevada City herd and the resident Motherlode deer herd, which generally resides in the Bridgeport vicinity. Supporting over 100 species of animals and birds, oak woodlands are one of the most significant habitats found in the South Yuba canyon. Connell stated that over 100 species of animals and birds rely on oak forests.

Each year when snow melts, the Nevada City deer herd crosses the river to return to high country. The herd always follows the same migration routes, crossing the South Yuba about 5 miles east of Washington, just upstream from Holbrook Flat, and also crossing above Spaulding Reservoir.

The deer are quietly followed by mountain lions, which also live in the forested river canyon. Another reclusive feline, the bobcat, inhabits the South Yuba canyon as well. Bobcats are more active and likely to be seen during the day. They eat rabbits, ground squirrels, pocket gophers, and other rodents.

Ring-tails also range throughout the canyon, hunting mice and small rodents. Their long, striped tails help them balance when climbing in trees and on rocks. Because they are strictly nocturnal, ring-tails are not often seen by people.

A good black bear population inhabits the South Yuba canyon between Spaulding Dam and Highway 49. These omnivores eat manzanita berries, grasses, acorns, and grubs.

Near the river’s headwaters, the wolverine (federal category 2, California threatened, species of special concern) and Pacific fisher (California species of special concern, USFS sensitive species) have been sighted. According to Forest Service wildlife biologist Diana Craig, these rare species are known to use
river areas as travelways. The Pacific fisher has an extremely large range, between 1,000 and 5,000 acres. Wildlife biologist Catherine Fowler, from the University of California at Davis, reported that a fisher has also been sighted near Washington.

According to Dave Connell, pine martens (USFS sensitive species) inhabit the South Yuba River canyon. The lithe martens often take refuge in the cavities of trees, where they hunt for squirrels and small birds. Martens also eat other small rodents.

A partial list of mammals found in the South Yuba River corridor follows.

- Mule deer
- Mountain lion
- Coyote
- Snowshoe hare
- Long-tailed weasel
- Golden mantled squirrel
- Black-tailed deer
- Black bear
- Bobcat
- Allen chipmunk
- Beaver
- Ring-tail
- Gray fox
- Wolverine (CA species of special concern)
- Pacific fisher (CA species of special concern)
- Pine marten (USFS sensitive species)

Other mammals identified by the Bureau of Land Management (BLM) as possible inhabitants of the South Yuba canyon are the Pallid bat (California species of special concern) and the Townsend’s big-eared bat (federal candidate 2, California species of special concern). Both species are highly sensitive to human disturbance. Because there are few human intrusions in the steep rugged terrain of the South Yuba canyon, BLM biologists believe there is some possibility of finding colonies of these bat species.

**Birds**

In the Washington vicinity, the Tahoe National Forest monitors spotted owl habitat areas, some of which lie adjacent to the river. According to Forest Service wildlife biologists, California spotted owls (USFS sensitive species) forage along the edge of the South Yuba River in areas where the canopy is thick. BLM has reported California spotted owl sightings in the river corridor west of the Tahoe National Forest boundary as well.
Several other predatory birds also soar through the canyon. The Northern Goshawk (California species of special concern), which prefers to nest in old trees close to water, inhabits the South Yuba canyon. The bald eagle (federal endangered, California endangered) is known to forage in the canyon during the winter, and the golden eagle (California species of special concern) has been sighted in the Bridgeport area and in the river canyon above Humbug Creek. Extensive rimrock outcrops provide important raptor nesting habitat. According to BLM biologists, there is potential for peregrine falcons (federal endangered) to nest on the canyon’s cliff walls.

A wide variety of smaller birds also use the South Yuba canyon. More than 135 species of California birds depend on or prefer riparian habitats. A partial list of birds identified in the South Yuba canyon by the Sierra foothills chapter of the Audubon Society and others follows.

- Acorn woodpecker
- Yellow-breasted chat
- Lesser goldfinch
- Common merganser
- Western tananger
- Northern oriole
- Great blue heron
- Yellow warbler (CA species of special concern)
- Red-headed sapsucker
- Black-headed grosbeak
- Black-throated gray warbler
- American dipper
- Lazuli bunting

The yellow warbler and the yellow-breasted chat migrate from tropical climes each spring. According to biologist Diana Craig, these and other neotropical migrating species are experiencing significant declines in population due to loss of habitat throughout their range. The South Yuba canyon, however, continues to provide excellent habitat for these colorful birds.

Dave Connell reported that flocks of band-tailed pigeons, whose numbers are declining throughout the West, also frequent the South Yuba. These native western migratory pigeons depend on acorns and madrone berries available in oak woodlands and chaparral of the South Yuba canyon. Band-tailed pigeons have been known to eat the acorns of live oaks whole!

The pileated woodpecker (USFS sensitive species) has been sighted in the river corridor. This bird, whose habitat has
been declining with the logging of mature forests, requires conifer forests near permanent water.

Biologists suspect that the black swift (California endangered) might also inhabit the river canyon. The black swift prefers breeding in crevices in the cliffs of deep canyons, such as the outcrops found along the South Yuba.

Amphibians, Reptiles, and Insects

This less glamorous group is critical to the well-being of all other wildlife in the river corridor. Many larger birds and some mammals eat amphibians and reptiles, which in turn eat insects. Insects also provide food for fish. During times of drought, the deep pools of the South Yuba River serve as a refuge for amphibians and aquatic insects.

The foothill yellow-legged frog (California species of special concern) has been sighted in the Washington vicinity and in Humbug Creek. Because this mottled yellow or orange frog sits motionless on stream banks, it is often not seen until it jumps into water. According to Forest Service fish biologist Monica Banholzer, potential habitat for the mountain yellow-legged frog and the Sierra red-legged frog (California protected species of special concern) exists upstream of Missouri Bar. Other more common amphibians present in the river corridor include the California newt, the long-toed salamander, and the Pacific tree frog. Biologists are just beginning to understand that amphibian populations are plummeting to all time lows throughout the state.

Reptiles sighted in the South Yuba River corridor include western rattlesnake, California mountain kingsnake, rubber boa, and common garter snakes. Western fence lizards and gilbert skinks have also been seen. According to Tom Taylor, former Fish and Game aquatic biologist, the river provides suitable habitat for the western pond turtle (federal candidate 2, California species of special concern), the only turtle native to interior California.

BLM identified several special status insects as potential inhabitants of the South Yuba River Canyon, including the spiny rhyacophilian caddisfly (federal candidate 2), the long-tailed caddisfly (federal candidate 2), and the golden-horned caddisfly (federal candidate 2). The valley elderberry long-horned beetle (federal threatened) was also identified by BLM. The blue
elderberry bushes that beetles exclusively depend upon for their survival grow in lower elevations of the South Yuba corridor.

The South Yuba River Fishery

Despite its seasonal low flows, the South Yuba supports both a cold and warm water fishery. Four known native species, including the Sacramento squawfish, the hardhead (California species of special concern), the Sacramento sucker, and the rainbow trout inhabit the South Yuba. Self-sustaining populations of brown trout survive the summer and autumn in the river's cool, deep pools. Other introduced fish, including the green sunfish and the small-mouth bass, also live in the river. All species rely on the South Yuba and its tributaries for spawning. According to state Fish and Game fisheries biologist John Hiskox, the South Yuba may be significant for the diversity of species, both native and game, that it supports.

Low South Yuba flows resulting from diversions at Spaulding Dam are responsible for higher water temperatures, which have influenced the fish species composition. For example, the native Sacramento squawfish, which thrive in warmer water, have become more numerous, while trout are much less abundant. In addition to displacing trout, squawfish also prey heavily on them. In turn, the progeny of the squawfish are preyed upon by smallmouth bass, which have become established below Highway 49.

Though limited most of the year, the South Yuba’s flows can be substantial in the spring. These high flows help to bring young fish from tributary streams into the main South Yuba channel.

The South Yuba’s spring flows below Spaulding may be critical for maintaining populations of anadromous fish in the main Yuba River below Englebright Dam. These fish are among the last wild run of salmon and steelhead in the Sacramento-San Joaquin system because other runs are supported by hatcheries. “Because diversions and reservoirs on the Middle and North Yuba hold back spring flows for water supply and hydroelectricity later in the season, the South Yuba is the major source of spring flows for rearing salmon and for juveniles that are migrating downstream,”
according to Eric Gerstung, who coordinates the state Department of Fish and Game’s work on threatened salmonids. The South Yuba provides at least 50 percent of springtime flows below Englebright Dam. These flows are essential for salmon in the lower river because Daguerre Point Dam, upstream from Marysville, diverts up to 50 percent of the Yuba’s flows.

Aside from low flows, sediment from mining may also affect fish populations. Dredging overturns gravels, disrupting the incubation of fish eggs and populations of aquatic insects that provide food for fish. Dredging can also loosen silt, which may also smother trout eggs and damage aquatic insect populations.

The state Department of Parks and Recreation is currently sponsoring a study that investigates the possible effects of siltation from historic hydraulic mining sites on fish and invertebrate populations in the South Yuba. This study is being conducted by fisheries biologists at the University of California at Davis and will be published in December 1993.

The Scenery of the South Yuba

From rugged Sierra peaks through deep granite gorges, from forest-sloped canyons and boulder-garden rapids to the graceful rolling terrain of the Sierra foothills, the South Yuba flows through a beautiful and varied landscape.

In the South Yuba headwaters of Lower Castle Creek, there are outstanding scenic views of Castle and Basin Peaks. The upper South Yuba cascades through rapids and over numerous waterfalls. The Forest Service manages this reach of river, which parallels Interstate 80, for “retention” of visual qualities. Above Spaulding Reservoir, timber harvest plans must account for maintaining views from the river.

From below Spaulding Dam to its western boundary, Tahoe National Forest has identified the scenery of the South Yuba canyon as “variety class A,” a designation recognizing high visual quality based on the variety of landforms, rockforms, waterforms, and vegetation present. For this reason, the Forest Service manages the river corridor for “partial retention” of visual qualities. Timber harvest plans must account for maintaining the overall integrity of views from the river canyon.
The view of the South Yuba River is a scenic highlight of any drive on Highway 49—the major roadway of the Sierra Nevada foothills and a National Scenic Byway.
According to Forest Service landscape architect Phil Horning, "There is a high level of spatial definition for the entire canyon." Sheer cliffs and rocky crags rise from the river for more than 2 miles below Spaulding Dam. In this reach, giant white boulders funnel water into plunge pools. Some waterfalls drop more than 20 feet.

As the river emerges from its granite gorge, mixed conifer stands on north-facing slopes and oak woodlands on south-facing slopes add new visual interest. The wispy branches of riparian shrubs and trees, including willows, alders, and red osier dogwood, fringe the edges of the river. Wide gravel bars of rounded river cobbles form on the inside of bends.

Where the gradient steepens, large water-sculpted stones create delicate ripples and thundering rapids. Deep blue-green pools form below these maelstroms of water. Sandy beaches lie amid the rocks along the shore.

From the river's banks, the visual scene is dominated by water foaming around smooth granite boulders. Because of the steep vertical relief of the canyon, views focus on the river. From trails above, wider views encompass longer stretches of river flowing around curves and bends of the incised canyon.

The South Yuba River canyon is the scenic highlight of any drive on Highway 49, the major roadway of the Sierra foothills. Looking upstream from the bridge, water tumbles through dramatic granite boulders in the foreground, and a view of the canyon extends as far as the eye can see. No other river crossing provides a view of this quality along the entire length of Highway 49, which extends from near Fresno all the way to Downieville. The highway is part of the National Scenic Byway system.

Near the river's mouth, the canyon widens, and chaparral vegetation prevails. Historic buildings and flat open areas at Bridgeport make the scene more pastoral. Throughout the canyon, remains of historic sites, such as miners' cabins, ditches, and flumes, lend visual interest by invoking thoughts of the past.

In the South Yuba canyon, the combination of a deep granite gorge, dark-green forested slopes extending to the river banks, gleaming white boulders forming churning rapids, brilliant sandy beaches, and open countryside all produce great visual variety and quality. Because of these qualities, the National Park
Service in its Nationwide Rivers Inventory identified the outstanding scenic value of the South Yuba.

The History of the South Yuba River Canyon

Archaeologists know that the rich ecosystem of the South Yuba River canyon has sustained people for thousands of years. Before Euro-Americans arrived, the Hill Nisenan inhabited the western Sierra foothills, where they lived in large community settlements during the winter. In spring and summer, smaller family groups dispersed into the high country and the river canyons to gather food. Each year when salmon returned to the lower South Yuba, the Nisenan were ready at their favorite fishing sites with spears, dip nets, and hooks made of squirrel leg bone. The Hill Nisenan also caught the plentiful lamprey eels, hunted rabbits and deer, and foraged for acorns on the hillsides.

The Nisenan’s lives changed dramatically when Euro-Americans made their way into California. One of the most popular routes over the Sierra led along the South Yuba right into the heart of Nisenan country. In 1844, the first wagon caravan of overland pioneers used this route to cross the mountains. In 1846, an estimated 500 wagons followed the same route, including the ill-fated Donner party whose name the pass now bears.

Because most overlanders followed a route right along the course of the South Yuba for 10 miles, many mentioned the river in their diaries. For the most part, travellers regarded the stony channel as a menace. In 1850, for example, traveller John Steele wrote “We followed the brook [South Yuba] upon a bed of large granite boulders, difficult for teams and dangerous to wagons, until we reached the brink of a deep abyss down which the stream, by a succession of cascades, fell in spray.” At this point, upstream from today’s Spaulding Dam, the overlanders crossed a ridge and travelled southward out of Hill Nisenan territory towards settlements in the Central Valley.

When gold was discovered at Sutter’s Mill, gold fever spread like wildfire, spurring the California Gold Rush of 1849. By the following year, thousands of prospectors and people
In the Yuba River basin, prospectors found particularly rich gold deposits early on, and before long, the narrow banks of the South Yuba were lined with mining camps. In 1849, pioneer John Rose built a corral near present-day Bridgeport intending to trade with the Nisenan, but by the late summer, scores of miners were already working the river's gravels. Instead, Rose operated a trading post to serve the prosperous mining camps. At first, several Nisenan were hired to work as miners, but most white miners resented competing with them. The native Americans were displaced; eventually many died from disease or were killed by early pioneers.

In the Washington area, even more mining camps marked the river banks. Historic records indicate that numerous mining camps extended along river banks downstream from Washington, including Jefferson, Whiskey Bar, Brandy Flat, Portuguese Point, Jackass Flat, Lizard Flat, Louisa Bar, Missouri Bar, and Illinois crossing.

The town of Washington became the urban and social center for mining camps in the upstream districts of the South Yuba River basin. By August 1850, about 1,000 men mined the river gravels at Washington, and 3,000 worked in the areas up and downstream. By the 1870s, the flourishing town had several stores, saloons, two hotels, a butcher shop, a shoe store, and eight schools. A sizable population of Chinese miners lived at Brass Wire Bar just across the river and at Grissel Bar, a short distance upstream. Still more camps were crowded along the river banks upstream from town, including Rocky Bar, Jimmy Brown's Bar, Keno Bar, Canal Bar, and Long Bar.

Interest in supplying mines and marketing California's natural resources nationwide provided impetus for the construction of the Central Pacific Railroad through Donner Pass in the early 1860s. The railroad paralleled the old Emigrant Trail and the upper reaches of the South Yuba River. Chinese laborers painstakingly bored tunnels through Sierra granite. In the spring of 1869, the Central Pacific crossed Nevada and connected with the Union Pacific Railroad, opening up the nation's first transcontinental rail line.

Through several spur-line connections, the Central Pacific Railroad helped to serve the mining districts in the South Yuba
basin. By the 1870s, miners had advanced from simple gold panning to hydraulic technology. With giant nozzles spraying highly-pressurized water, miners disintegrated hillsides into silty liquid; others then sluiced the gritty mixture in wooden boxes to settle and separate the valuable gold.

Along with hydraulic mining, great changes came to the South Yuba River watershed. To create high pressure for the hydraulic process, mining companies and newly created ditch companies dammed tributaries of the Middle and South Yuba rivers, forming reservoirs high in the mountains that left streambeds dry. Hundreds of miles of ditches and flumes carried the diverted torrent—oftentimes from an entirely different watershed—toward hydraulicking sites, where it emerged through the high pressure nozzles day and night. In 1878, three South Yuba basin mining companies built the nation’s first long distance telephone line to communicate with ditch and reservoir tenders who controlled the powerful flow of water.

Aside from removing vital water from the river channels, hydraulic mining produced abysmal pollution. When miners finished sluicing the silty water, it was drained back into river channels. At Malakoff Diggins, one of the largest hydraulicking sites in the world, an 8,000 foot tunnel was built 200 feet deep to carry drain water to the South Yuba. An estimated 700,000 cubic feet of earth were washed into the river. At times the silt load was so heavy that the river deposited sediments 100 feet high in some locations.

The silt caused other problems downstream. Where the main Yuba’s gradient leveled in the Central Valley, sediments were deposited in the streambed. For years, this deposition caused the river to overflow its banks and even its levees, repeatedly flooding fields and communities. After a dam on the Middle Yuba burst and released a treacherous wall of water, irate Marysville farmers brought a lawsuit against the upstream mining companies. In January 1884, Federal Circuit Court Judge Lorenzo Sawyer decided that the adverse effects of hydraulic mining could not continue. He ended hydraulic mining in what became one of the nation’s first environmental rulings. After Sawyer’s decision, mining continued, but on a much smaller scale. When miners left the South Yuba, vegetation slowly began to reclaim the heavily manipulated river banks.
While mining was what first attracted thousands of people to northern California, a sizable network of other services and businesses also developed. As the Gold Rush waned, these other industries, including agriculture and timber, grew in the foothills and the Central Valley. In 1906, President Theodore Roosevelt established Tahoe National Forest to better manage logging in the northern Sierra.

With expanding industries, California's population also continued to grow—especially in towns and cities. New urban and industrial growth created new demand for power and water. To accommodate the changed society's new needs, old mining ditches and flumes were converted to irrigation ditches. Old dams were also retrofitted to generate hydroelectricity. In 1892, Pacific Gas and Electric (PG&E) built an early Spaulding Dam in a dramatic gorge on the South Yuba River, where water had been diverted into the South Yuba Canal. The resulting hydroelectricity was conveyed in 1895 to the Bay Area on PG&E's first long distance transmission lines. After that, little water flowed in the South Yuba below Spaulding Dam during summer and autumn until downstream tributaries donated their flows.

With growing urban populations, there was an emerging need for recreational opportunities. One of the earliest recreational visitors to the Yuba was John Muir, founder of the American conservation movement. In a famous passage from his writings about the Sierra, Muir clung to a tree while revelling in the intensity of a wind storm in the Yuba basin.

New roads also enabled California city dwellers to escape urban ills by travelling into the Sierra. By 1915, the nation's first "coast to coast" highway crossed Donner Pass. Fifteen years later, U.S. Highway 40 followed the same historic route. In the early 1930s, roads to mountain ski resorts remained open through the winter. In the summertime, the beautiful Sierra landscape enticed campers and anglers to the headwaters of the South Yuba River. New Deal monies funded campground and trail building activity on public lands.

During the Depression there was a second, smaller gold rush on the banks of the South Yuba. Poverty impelled people—sometimes whole families—to set up camps near the river, where they panned for gold and caught fish. Near Bridgeport, 2,000 to 3,000 people camped in tents and shanties.
During the same period, the Army Corps of Engineers began building a debris-collection dam just below the mouth of the South Yuba River, ostensibly to collect silt still eroding into the river. Soon after construction was completed in 1938, Englebright Dam was retrofitted for hydroelectric generation. According to Corps reports, Englebright has never served the debris-collection purpose for which it was authorized. The dam blocked the migration of salmon and steelhead up the South, Middle, and North Yuba.

In their travels to camps and resorts in the mountains, Californians discovered the inviting beauty of the Sierra foothills. Over time, Nevada County became increasingly populated by people seeking a high quality of living. Among this group of new residents, a new awareness of the South Yuba grew. People living in Nevada City and Grass Valley went regularly to the river to swim and scramble along the rocky banks.

As Nevada County grew, its population of river-loving citizens grew as well. In 1983, when the Northwest Power Company pursued plans to dam and divert the South Yuba just above Highway 49, concerned local citizens organized to protect the river. The South Yuba River Citizens League (SYRCL) was formed. SYRCL now has over 1,200 members, demonstrating the broad local support for river protection. Two hydroelectric proposals have been successfully defeated, and the river continues to flow freely for 40 miles from below Spaulding Dam to Englebright Reservoir.

Archaeological and Historical Sites

Given the rich history of the South Yuba River, numerous prehistoric and historic sites remain. Several historic landmarks are registered or eligible for the National Register of Historic Places. Only 8 percent of Nevada County has been systematically surveyed, but a high density of sites was found—one for every 35 acres. At that rate, the Nevada County Environmental Inventory predicts that 16,400 sites remain undiscovered in the county.
Thousands of miners crossed the South Yuba by way of the covered bridge at Bridgeport, the longest span of its kind. Though remnants of gold-mining days can still be seen in the canyon, the river has largely recovered from the Gold Rush.

Because there is a higher probability of habitation and use in areas less than 1/4 mile from permanent water sources, archaeologists agree that there is a high potential for prehistoric sites in the South Yuba River canyon. Many of these, however, may have been damaged or destroyed during the Gold Rush.

In the Bridgeport vicinity, the Army Corps of Engineers identified 27 prehistoric sites consisting primarily of middens and bedrock mortars, which are known to exist throughout the South Yuba corridor. The Corps also identified 45 historic sites in this area, the most significant being the Bridgeport covered bridge (National Register of Historic Places, California State historic Landmark #390, Registered Civil Engineering Landmark). Built by David Wood in 1862, the structure replaced several smaller bridges that washed out in 1861. According to the state Department of Parks and Recreation (DPR), it is a rare example of double arch with Howe truss construction, one of the oldest remaining covered bridges in the West, and the longest single-span wooden bridge in the world, at 243 feet.
The bridge was part of the Virginia Turnpike (1853-1901, eligible-National Register of Historic Places), the primary trade route from California's commercial centers to Nevada's Comstock Lode. The only remaining parts of the turnpike are still visible in the Bridgeport vicinity. The remaining Bridgeport townsite (1849-1940s, eligible-National register of Historic Places) includes a pioneer cemetery dating to 1852.

In the area upstream from Bridgeport, the 35-mile-long Excelsior Mining Ditch (eligible-National Register of Historic Places) can still be found on the south side of the river canyon. This ditch, with its extensive series of flumes, originally transported water to mining sites near Marysville. After mining activity declined, the ditch carried irrigation water until 1961. Now its grade is used for the wheelchair-accessible Independence Trail.

Just downstream from Highway 49, Jones Bar was the site of four different bridges (1850s) on the wagon road from Nevada City to North San Juan. Parts of the old road can still be identified in the canyon.

The concrete arch bridge where Highway 49 crosses the South Yuba (eligible-National Register of Historic Places) is of unique design. The bridge offers visitors a classic view up the South Yuba canyon. It will become a pedestrian walkway when Caltrans completes the new Highway 49 crossing.

Upstream from Highway 49, the Miner's Tunnel (1872, eligible-National Register of Historic Places) was hand-drilled through rock with the intention of rerouting the South Yuba's winter flows away from mining operations in the river bed. Near the upstream end of the Miner's Tunnel is Hoyt crossing, the site of a Gold Rush era river crossing and mining camp.

Just below Purdon crossing, the remains of an old PG&E powerhouse exist along the river. At the same site, portions of a rock dam built in 1856 to divert water into Excelsior Ditch are also present. The crumbling remains of the dam unobtrusively resemble other rapids in the rocky channel.

The Purdon Crossing bridge (eligible-National Register of Historic Places) is the only bridge in California that relies on a half-through truss support system. Built in 1895, the bridge deck
is supported halfway between its top and bottom cords, and its metal rails are connected with Pratt pins.

The historic South Yuba Road (paralleling today’s North Bloomfield Road) was an early toll road linking Nevada City to Lake City. The road first crossed the river in 1853 at the site of Edwards crossing, named for William Edwards, proprietor of the toll bridge in the 1870s. The present-day Edwards Crossing bridge (eligible-National Register of Historic Places) was constructed in 1904 with triangular members and steel pins in a three-hinged metal arch configuration.

Illinois crossing is located upstream from Edwards crossing. William Edwards operated a ferry service at this mining camp in 1854. Historic records indicate that many other mining camps existed upstream from Illinois crossing, including Banjo Bar, Missouri bar, and Louisa Bar.

Also upstream from Illinois crossing, the North Bloomfield Drain Tunnel (National Register of Historic Places) enters the river from the north via Humbug Creek. The 8,000-foot-long tunnel is 200 feet deep in places and was used to drain water from hydraulic processes at Malakoff Diggins (California State Historic Landmark #852).

According to archaeological surveys conducted by the Army Corps of Engineers in the area between Edwards crossing and Washington, there are “two significant historic period townsites and the potential for several smaller mining-related settlements.”

The town of Washington is a historic site that still retains some of its original character. Each summer the town hosts a “pioneer day” that attracts visitors intrigued by Gold Rush history. In Gold Rush days, the town was the social center for the dozens of mining camps that stretched up and down the river.

Upstream from Washington, Maybert Road follows along the river’s north side. A narrow wood and metal bridge (eligible-National Register of Historic Places) crosses the tributary Canyon Creek just before it enters the South Yuba. Upstream from the present-day Forest Service picnic grounds, the sites of three old mining towns, Ormonde, Eagle Bird, and Maybert, remain. Other old mining sites, including sites mined exclusively by Chinese workers, remain as well. According to local archaeologist Hank Meals, at least one prehistoric site that should be eligible for the
National Register of Historic Places exists between Washington and Lang crossing.

Because so little timber harvesting occurs in the river corridor, Forest Service archaeologists have not had an opportunity to survey the area. According to Tahoe National Forest archaeologist Bill Slater, more prehistoric sites remain above Spaulding Reservoir, upstream from heavily mined areas.

Above Spaulding Reservoir, what remains of the Emigrant Trail parallels the South Yuba River from the present-day Big Bend campground to Donner Pass. Interpretive signs mark some of the well-known river crossings of this trail, designated as a National Historic Trail by Congress.

Recreation

The well-loved South Yuba River provides local residents with places to swim, walk, and meet friends year round. During summer months, parking areas at river crossings are full beyond capacity, spilling over with eager river enthusiasts. The many sandy beaches interspersed between giant boulders provide numerous secluded spots. Some of the larger beaches are meeting places for mothers with children and for families. The clear swimming holes offer residents a refreshing place to cool off and relax. Even in January, it is not uncommon to find ten cars parked at Edwards crossing. An extensive network of trails provides access to the river and spectacular views of the canyon. The temperate climate of the canyon makes for pleasant hiking without snow cover all the way up to Washington and beyond in some years.

The South Yuba is one of the most visited attractions in Nevada County. According to an ongoing visitor use survey conducted by the California Department of Parks and Recreation (DPR), people made 671,000 visits to the South Yuba on Bureau of Land Management (BLM) and DPR lands in fiscal year 1991-92. This visitor figure has increased steadily over the past few years.

Most river use is not local. A survey conducted by the South Yuba River Citizens League (SYRCL) in the summer of 1986 at the Highway 49 crossing indicated that 75 percent of river
In the summer, families flock to the water for refreshment at Bridgeport, the locus of the South Yuba River Project, which will be California's premier river-oriented state park.

visitors came from outside Nevada County and 50 percent came from more than 100 miles away. The river is located within a three-hour drive from much of the San Francisco Bay Area and a one-and-a-half-hour drive from Sacramento. Approximately 8 million people live within a four-hour drive. On the basis of DPR ranger interviews and citation records, the majority of visitors at the Highway 49 bridge come from the large metropolitan centers of the Sacramento and the San Francisco Bay Area. DPR planners estimate that 170,000 people annually visit the South Yuba at Highway 49.

Rangers report that many river users at Bridgeport drive up Highway 20 from Marysville and Sacramento. At Purdon and Edwards crossings, local people from Grass Valley and Nevada City have their favorite alcoved beaches amid the river’s smooth
boulders. According to the BLM recreation planner Jim Eicher, recreation on the South Yuba consists mostly of day use activities such as swimming, wading, sunbathing, hiking, fishing, and boating.

The Forest Service has no user-day figures for the river-corridor lands they administer below Spaulding Dam. Above Spaulding Reservoir, three Forest Service campgrounds along the South Yuba accommodated over 26,000 visitors during the summer of 1992. A commercial campground on the shores of the South Yuba in Washington also reported that its 100 campsites accommodated 2,500 visitors during the summer of 1992. A survey of the most popular recreational activities on the South Yuba follows.

Swimming

During the summer, the most popular activity on the South Yuba in swimming. Because of low flows, the river’s clear, deep pools are warm. Large boulders form enchanting swimming holes
The South Yuba offers a variety of enchanting swimming spots, such as the pool below this falls upstream from Holbrook Flat.

and secluded spots to sunbathe and relax. Up and down the entire river, there are hundreds of special places— all with their own unique configurations of boulders, beach, and water.

Downstream from Bridgeport, there are long gravel beaches and shallow swimming areas that make good places to wade and splash with small children. At Bridgeport, visitors find easy parking near the bridge and several large, open flat spaces suitable for picnicking. The historic covered bridge and nearby interpretive exhibits intrigue visitors each time they come.

The Highway 49 crossing is also an extremely popular summer spot. At times, competition for parking spaces can be fierce. Many visitors follow the trail upstream from the bridge down to swimming spots along the river. BLM planners estimate that each year, 35,000 people hike the trail to Hoyt crossing, an old, shallow-water fording spot. A short distance downstream from the bridge, people also hike down the old Jones Bar Road to swim in the river.

At Purdon and Edwards crossings, major roads are left far behind. Local residents find places for sunbathing and swimming
This trail in the Bridgeport area is one of many in the South Yuba canyon offering year-round hiking opportunities for everyone.

amid large water-sculpted boulders in the pristine setting of the wild river canyon.

At the town of Washington, two private campgrounds with river frontage offer visitors who prefer more developed facilities a good place to wade and swim in the South Yuba. Upstream from town, at two Forest Service picnic areas—Golden Quartz and Kelleher—visitors find still more swimming areas.

According to DPR surveys, swimming ranks as the most popular recreational activity in California. However, swimming in rivers is far more popular than swimming in reservoirs. The busiest local reservoir, Englebright, accommodated an average of only 128,655 visitors per year from 1988 through 1992. Reservoir visitation rates drop dramatically when reservoirs are drawn down.

According to recreation specialist and consultant Pete Dangermond, “recreation areas with water features are the most desirable,” and given California’s rapidly growing population, “their protection for public use is of prime concern.”
The Independence Trail, built for disabled people near the Highway 49 bridge, provides an extraordinary opportunity for access to a wild canyon.

Hiking

The South Yuba's largely undeveloped wild corridor and trail system provides excellent opportunities for hiking year round. From almost every river crossing, a path extends up or down river at least for a short distance. Trails down tributary streams also provide access to the river. Throughout the winter, one finds many cars parked at each crossing. Hikers and walkers take advantage of the mild climate and clean air to refresh their spirits.

At Bridgeport, several short trails wind through oak woodland and chaparral. On the north side, visitors can hike one mile downstream to the mouth of the South Yuba at Englebright Reservoir. There the trail connects with another trail around the reservoir. On the south side, a wheelchair-accessible trail extends for several hundred feet. Another trail that follows upstream for 1.5 miles is popular with wildflower enthusiasts during the spring.

The most unique trail in the South Yuba canyon is the Independence Trail, the longest wheelchair accessible wilderness trail in the nation. The trail follows the grade of the historic Excelsior Ditch on the south side of the river, and will extend 2.5
miles in each direction from Highway 49 by October 1993. The earthen ditch, wide and flat enough to accommodate wheelchair use, clings to the side of the canyon several hundred feet above the river. In several places, new wooden catwalks have replaced old flumes to create a level surface on an otherwise impossibly steep slope. The ten-mile round-trip trail affords several scenic views of the river canyon. A covered picnic area is located about one mile west of Highway 49 on the trail. Most significantly, the flat trail offers a unique opportunity for physically disabled people to enter a wild canyon forest. It also provides a good place for families to hike, for people to jog, and for school groups to gain easy access to a protected natural area without strenuous exertion. In 1992, 1,000 school children hiked the trail, and 300 visitors used wheelchairs to enjoy the trail. Overall, 8,000 visitors came. Trail register records indicate that one-third of the visitors came from Nevada County, one-third came from Sacramento, and one-third came from more distant places. The Independence Trail is being constructed and maintained by Sequoya Challenge, a local non-profit organization. The group is also working on a two-mile trail along Excelsior Ditch several miles downstream of Highway 49, to accommodate bicyclists and horseback riders who are not permitted on the Independence Trail.

The South Yuba Trail, which extends along the south side of the river from Purdon to Edwards crossing, is another significant trail in the canyon. It was included in the National Trails System, a program started by Congress in the early 1970s. The trail runs 4 miles through mixed-coniferous forest with many good views of the river. Upstream from Edwards, hikers can walk along the river in dry seasons, or north up the road to link up with another section of the South Yuba Trail. It extends along the river 4 miles to the boundary of Tahoe National Forest.

The Humbug Trail begins at Malakoff Diggins State Historic Park and follows the scenic Humbug Creek for 2 miles as it cascades down a steep ravine to the South Yuba. Humbug Trail intersects the South Yuba Trail at the mouth of Humbug Creek.

A planned trail through Forest Service lands will soon extend the South Yuba Trail for 7 miles to Poorman Creek, just downstream from the town of Washington. This new stretch will eventually create a trail along 17 miles of the river. In addition, from near Malakoff Diggins a Forest Service trail provides access to the river at Missouri Bar, 5 miles below Washington.
Upstream from Washington, a partially paved road follows the river for 4.5 miles before it turns into a trail. The many abandoned mining camps in this vicinity lend historic interest to hiking in the river corridor. At Lang crossing, there are no developed trails, but visitors routinely scramble over mounds of granite to find spectacular views of the river flowing through its deep gorge. In this area, hikers can still see remains of the historic flumes of the South Yuba Canal high above the river along the canyon wall.

Upstream from Spaulding Reservoir, visitors can hike along sections of the historic Emigrant Trail, where they can still see rust marks from pioneer wagons that rolled over the rocky terrain. At present, this route is not maintained except for a few interpretive signs. The Tahoe National Forest plans to better interpret and develop this significant historic trail in the future. More off-trail hiking is also possible up Lower Castle Creek to the Sierra Crest.

The planned South Yuba State Park offers potential for a system of trails running the entire 40 miles from Englebright Reservoir to Spaulding Dam. The South Yuba Trail, when linked up with the planned Forest Service trail, will enable backpackers to hike for more than 17 miles through one of the wildest parts of the river canyon. In the long term, it may also be possible to connect existing trails all the way to Bridgeport.

According to a statewide outdoor recreation use survey conducted by DPR in 1987, nearly 38 percent of the respondents regularly hiked on trails, and 25 percent participated in backpacking activities. With the demand for hiking opportunities so high, the trail network of the South Yuba serves an important role in the region’s recreational plan.

**Angling**

While fisheries biologists agree that the South Yuba game fishery is less than superlative because trout populations are low, local anglers will tell you otherwise. Jerry Fugi, a Nevada City resident who has been fishing for 45 years, said he’s caught and released 100 trout a day—all over seven inches—in remote stretches of the South Yuba. He’s done it several times, always during years with good spring runoff. The high flows wash young
fish from tributary streams into the river’s main channel. Fugi, who also holds a degree in fish biology, added that some stretches of the river are “almost sacred” to local anglers.

Overall, few anglers cast into the waters of the South Yuba. That is one of the reasons that the fishing is so good in some places. Although there are no official numbers for angler usage, Fugi estimated that approximately six people hike into remote areas below Lang crossing to fish each week. He estimated that several dozen people each week fish near river crossings at Washington and Lang crossing.

Whitewater boating

Kayakers Lars Holbeck and Chuck Stanley include several whitewater runs on the South Yuba in their Guide to the Best Whitewater in the State of California. When water is flowing, the narrow, forested canyon of the South Yuba provides a long run of challenging rapids, accessible to boaters of moderate skill, in a wild setting.

The most popular run is the 13 mile stretch between Washington and Edwards crossing. The river drops 46 feet per mile in this exciting Class III-IV reach. Boaters must portage around one steep drop. Another popular run from Edwards to Purdon crossing is more difficult. In this Class III-IV reach, the river drops 65 feet per mile.

Below Purdon crossing, the gradient becomes even more steep and the boating even more technical. The four mile stretch to Highway 49 drops 125 feet per mile and is rated Class IV-V. The seven miles from 49 to Bridgeport where the river drops 90 feet per mile, are also rated Class IV-V.

For the most part, only kayaks can make their way through the narrow slots of the South Yuba canyon, but during high water, rafts too can navigate the Washington to Edwards reach. A few people have also rafted the technical water between Edwards and Bridgeport, but this reach is exceptionally difficult. Boating occurs exclusively in the winter and spring when snow melts and runs off, and whenever Spaulding Dam spills water. Because the window for boating is so limited, there are no commercial outfitters on the South Yuba. During peak runoff, however, many
At high flows, the Washington to Edwards reach is one of the finer one-day whitewater trips in California. Below Edwards crossing, steeper gradients are for experts only, including this rapid downstream from Highway 49.

Private boaters come to enjoy the wild canyon. The long whitewater reach between Washington and Edwards is accessible to boaters of moderate and advanced skills. In few other places does such accessible and exciting whitewater occur in such an undeveloped setting.

Other Activities

Beyond swimming, hiking, fishing, and boating, many other types of recreation take place in the South Yuba canyon.

Gold Mining: Both tourists and local residents pan for gold up and down the river corridor, especially in the vicinity of Washington. Mining with a gold pan requires no permit, and tourists can readily purchase supplies in Nevada City or Washington.
Rock Climbing: On the granite walls near Lang crossing, rock climbers can be found exploring new routes up the smooth rock.

Mountain Biking: In Washington, visitors can rent mountain bikes to ride up the unpaved road and trail along the north side of the river. Cyclists can also ride on unimproved roads on the river’s south side towards the abandoned Alpha and Omega mines east of town. A new two-mile trail along Excelsior Ditch several miles downstream of Highway 49 will also provide opportunities for mountain biking near the river.

Off-highway Driving: Off-highway vehicle enthusiasts can find a nationally renowned four-wheel drive trail paralleling Fordyce Creek, a South Yuba tributary that flows into Spaulding Reservoir.

Camping: Backpackers can spend a night at the South Yuba campground or at two other primitive BLM campgrounds along the river between Edwards crossing and Washington. Two commercial campgrounds in Washington and three Forest Service campgrounds above Spaulding Reservoir provide riverside camping for drive-in visitors.

Nature Study: Bird watchers enjoy the canyon year round. Several colorful neotropical migrants summer in the riparian zone of the remote canyon. Wildflower enthusiasts can find many species blossoming on the slopes of Castle Peak and in the low open areas near Bridgeport, where each spring, Sierra College botany classes come to see the kaleidoscope of color. According to DPR’s 1987 statewide outdoor recreation survey, 47 percent of the respondents participated in birdwatching and nature study.

Skiing: In the winter, people can cross-country ski in the Lower Castle Creek area and in other undeveloped areas of the river’s headwaters. A ski path from the Boreal Ridge exit on Interstate 80 to the base of Castle Peak is one of California’s more popular non-commercial places to cross-country ski. There are also five commercial downhill ski resorts in the South Yuba’s headwaters area.

With California’s population growing by leaps and bounds, new outdoor recreational opportunities will be crucial to
maintaining a good standard of living in the state. DPR estimated that total outdoor recreation in California is 2.5 billion visitor days per year. According to recreation specialist Pete Dangermond in *California’s Threatened Environment*, when California’s population increased by 3 percent in 1990, the recreation demand increased by 90 million visitor days. That’s the equivalent of 30 Yosemite Parks. To keep pace with the growth, 5,000 acres of developed parks and 25,000 acres of natural resource parks should have been added.

The demand for parks is not just statistical speculation. In the 1987 DPR survey of outdoor recreation use patterns, 90 percent of survey respondents felt that “increasing the protection of scenery and the natural environment” was the most important change that park agencies should accomplish. Furthermore, the overwhelming voter support for the 1988 citizens’ bond initiative to acquire and protect parklands, including land in the South Yuba corridor, also indicates that citizens statewide place a high value on parklands.

With Nevada County’s population expected to grow by 57 percent by the year 2005, with Sacramento’s population projected to skyrocket by the year 2000, and with the population of the Bay Area expected to increase by 17 percent in the 1990s, recreational opportunities afforded by the South Yuba will be more critical than ever.

**The River’s Value to the Local Economy**

The South Yuba River canyon forms a spectacular natural centerpiece for Nevada County. Flowing through a beautiful Sierra foothills landscape, the river is one of the primary natural features that attracts large numbers of new residents and visitors to the area.

The Nevada County Draft General Plan update recognized the South Yuba as a “unique recreational resource.” In July 1989, the County Board of Supervisors voted unanimously to support the planned South Yuba State Park extending from Bridgeport to Humbug Creek. In a letter to the state Department of Parks and Recreation (DPR), the Board recognized the importance of protecting the historical, cultural, and recreational features of the
South Yuba and stated that the planned park will assure “that the resources remain for everyone’s enhancement and enrichment.” The letter continues: “The Board recognizes and appreciates, further, that parklands within the county also stimulate tourism upon which the county’s economy heavily relies.”

The South Yuba River is one of the most significant attractions in the county. DPR planners estimated that people made 671,000 visits to the river last year and expect that this number will grow.

Most visitors come from outside Nevada County, many travelling from more than 100 miles away (see Recreation). It is common for visitors to stop in Nevada City or Grass Valley for dinner, shopping, and entertainment after spending a day at the river. The total taxable transactions at restaurants and bars more than doubled from 1980 to 1990. Visitors from far away stay in local bed & breakfasts and hotels for the night.

Urban economics consultant John Cone did a preliminary analysis of retail sales reported in Nevada County in 1991, which indicated that day visitors, tourists, and seasonal residents account for at least 11 percent, and perhaps as much as 25 percent of sales at Nevada County food and drug stores and service stations. Cone’s estimate is based on the fact that sales at these types of retail outlets exceed the purchase levels that would be expected from the number of households in the county, their average household income, and typical purchasing patterns.

Assuming conservatively that tourists and day visitors account for 11 percent of retail sales, visitor expenditures in Nevada County are estimated at $38 million per year. Assuming that South Yuba visitors account for 10 percent of visitor expenditures, they would spend $3.8 million per year at retail outlets. If the upper range figure, 25 percent, is used, South Yuba visitors account for $8.7 million per year in retail sales receipts. Cone similarly analyzed county lodging receipts and service receipts to determine that South Yuba visitors account for $0.5 million in lodging receipts and for $0.7 million for service receipts. Overall, Cone’s preliminary analysis based on taxable sales suggests that South Yuba visitors contribute at least $5 million in direct expenditures to the local economy (using conservative retail sales figure), and perhaps as much as $9.9 million. The true figure may lie somewhere in the middle.
South Yuba visitors, numbering in the hundreds of thousands per year, contribute substantially to the region's economy, which depends increasingly on recreation and tourism.

DPR estimated that, through direct visitor expenditures (based on $10 per day expenditure per visitor), the South Yuba State Park Project already contributes $6.7 million to the local economy. This figure compares well with estimates generated by Cone’s analysis of taxable transactions.

Dollars spent by outside tourists in Nevada County stimulate the local economy further. Every dollar spent by a tourist in the county turns over and is spent locally several times more. For example, when a tourist buys dinner, money goes to the chef, who might rent a video. Money then goes to the video store owner and clerks, who buy groceries—and so on. To account for this turnover in the local market, economists use multipliers to express the greater value of dollars spent by non-resident tourists. Using a conservative multiplier of three (tourism agencies often use seven), DPR estimated that South Yuba visitors infuse the county’s economy with $20.1 million annually. Furthermore, according to DPR, 89 percent of State Park operating costs are spent locally. Overall, DPR estimated that its three parks (Malakoff Diggins, South Yuba Project, and Empire Mine)
contributed $32,976,681 to the Nevada County economy in 1992. This figure includes direct visitor expenditures, operating costs, and a multiplier of three.

The same qualities and recreational opportunities that have drawn visitors to the South Yuba have also attracted many new residents to Nevada County. Local realtors at Coldwell Banker in Grass Valley have reported that the qualities of the South Yuba River make Nevada County a more desirable place to live. According to local realtor Charles Brock, “The South Yuba has continued to attract tourism and new residents for years.”

Nevada County is the fifth fastest growing county in California on a percentage basis, almost entirely due to immigration. From 1970 to 1991, the county’s population increased from 53,250 to 83,100. According to the California Department of Finance, by the year 2005 it is expected to increase by 57 percent, to 125,000.

Economic analysis by economist John Cone also indicates that Nevada County’s attractive environment and recreational opportunities—of which the South Yuba is a main component—have contributed significantly to the county’s growth. Nevada County is close to Sacramento, which is one of the fastest growing metropolitan areas in California, yet it has a more attractive Sierra-foothill setting and more desirable recreational opportunities than counties in the Central Valley. Cone analyzed growth trends in the region and the state and determined that 53 percent of Nevada County’s population increase was due to its mountain county character; 9 percent was because of Sacramento’s growth; and the remaining 38 percent was because of its own distinctive environmental and recreational advantages. Overall, Nevada County’s mountain character and recreational opportunities account for 91 percent of its total growth. Assuming conservatively that the South Yuba accounts for 10 percent of the county’s mountain character and recreational values, then 9.1 percent of the county’s increase in households, or 408 new households, can be attributed to the river during the 1980 to 1990 period.

Tourism and population growth attributable to Nevada County’s desirable setting have also created new jobs. Analyzing employment growth trends in the region and state, Cone determined that 48 percent of Nevada County’s increase in
employment was because of its mountain county character; 21 percent was because of Sacramento’s growth; and the remaining 23 percent of the growth is attributable to its desirable environmental and recreational advantages. Assuming conservatively that the South Yuba accounts for 10 percent of the county’s environmental and recreational advantages, then 2.3 percent of the increase in employment, or 324 jobs, can be attributed to the river. Presumably, the South Yuba accounts for more than 10 percent of the county’s environmental and recreational values, so estimated growth in population and employment attributed to the river is likely higher.

Using a different means of analysis, the Nevada County Chamber of Commerce estimated that a new job is created for every 1,200 tourists. With South Yuba River recreation use rates annually topping 450,000 visitors from outside the county, the Chamber of Commerce estimate would indicate that river-based recreation translates into at least 375 jobs in Nevada County. According to the Chamber of Commerce, 10 percent of jobs in the county are directly related to tourism.

Both by raising the quality of life in local communities and by attracting outside visitors, the South Yuba River is a substantial economic asset to Nevada County.

Land Ownership

Public lands make up 54 percent of lands in the South Yuba River corridor between Lang crossing and the National Forest boundary upstream from Humbug Creek, according to Appendix E of the Tahoe National Forest Draft Land Management Plan. The Bureau of Land Management (BLM) reported in 1993 that public lands ownership exceeded 50 percent from the National Forest boundary down to Bridgeport. For the total reach from Spaulding Dam to Englebright Reservoir, over 50 percent of lands in the river corridor are public lands.

Above the canyon rim, a network of unimproved roads provides access to the scattered homesites. However, the river corridor is largely undeveloped and unroaded.
Unroaded Riverfront

Bridgeport to Highway 49: 7 miles unroaded riverfront with unimproved access at Jones Bar 1 mile downstream from Highway 49

Highway 49 to Purdon crossing: 4 miles unroaded riverfront with unimproved access at Hoyt Crossing and above Devil’s Slide

Purdon to Edwards crossing: 4 miles unroaded riverfront

Edwards to Washington: 12.5 miles unroaded riverfront with unimproved access at Poorman Creek

Washington to Lang crossing: 6 miles unroaded riverfront; Maybert Road parallels the river for 4.5 miles upstream from the bridge at Washington

A description of river corridor land owners follows.

South Yuba River State Park Project

The California Department of Parks and Recreation (DPR) currently owns and administers nearly 6 miles of river frontage. These lands are part of the South Yuba River Project, a planned 21-mile-long, 14,475 acre river corridor park, extending from the boundary of Tahoe National Forest, upstream from Humbug Creek, and west to Englebright Reservoir. The South Yuba State Park will be the only state park unit to encompass such a significant length of riverfront. The planned park will link two existing park units, Malakoff Diggins (2,884 acres) and lands at Bridgeport (2014 acres), already known as the South Yuba River Project.

The South Yuba Project began in 1984 when DPR first acquired property near Bridgeport. Shortly thereafter, the Department approved staffing by a ranger. New impetus for this
unique park came in 1988 when voters statewide approved proposition 70, the California Wildlife, Coastal, and Park Land Conservation Act, which provided $2 million to acquire lands to extend the South Yuba River Park to its full 21-mile length. So far, the state has acquired nearly 3,000 acres of lands in and adjacent to the river corridor from willing sellers. The DPR is also securing conservation easements from private landowners who do not wish to sell their property. No private lands will be condemned. In addition, 6,000 acres owned by the Bureau of Land Management (BLM) will be transferred to the DPR for creation of the new park. This gift of federal land to the state of California has already been approved. According to DPR district Superintendent Ray Patton, the actual exchange of land is just a matter of time. All mining claims must be terminated before the transfers can occur.

In the meantime, DPR and BLM have agreed to cooperatively manage the interspersed state and federal lands. The planned state park is and will be managed to enhance the natural ecosystem and to provide undeveloped trail access to the wild river corridor. Along the river, park visitors enjoy hiking, swimming, sunbathing, gold panning, and seasonal whitewater boating.

Existing park facilities include picnic areas, a parking area, a visitor center, and trails both upstream and downstream at Bridgeport (see Recreation—Hiking). Caltrans is currently building a new bridge at Highway 49, with a 35-car parking lot to provide improved access to the DPR trail upstream from the bridge. The existing historic bridge will become a foot crossing. A short distance south on Highway 49, visitors find Independence Trail. From Malakoff Diggins, a DPR trail follows the scenic Humbug Creek for about 2 miles to the South Yuba (see Recreation—Hiking). As the park plan moves ahead, recreation planners will look at the long-term possibility of extending a riverside trail system throughout the park.

The Bureau of Land Management (BLM)

The BLM Folsom Resource Area has significant holdings in the 21 mile river corridor from the Tahoe National Forest
South Yuba River Land Ownership
half-mile-wide corridor
Englebright to Spaulding
boundary to Englebright Reservoir. BLM owns approximately 12 miles of river frontage. In addition, the agency manages many more acres adjacent to the river corridor, creating a wide swath of publicly owned wildlands.

BLM manages the corridor for resource protection and dispersed recreation. Existing recreational facilities include the South Yuba Trail from Purdon to Edwards crossing, the South Yuba Trail campground upstream from Edwards crossing, and two primitive camps along the trail above Edwards. There is also a limited parking area at Purdon crossing. Recreation consists mostly of hiking, picnicking, sunbathing, camping, swimming, fishing, gold dredging, and gold panning.

On BLM lands, mining occurs mostly on a recreational basis. No mining claims exist upstream of Purdon crossing, but miners can obtain 30-day recreational dredging permits. Below Purdon crossing, there are a small number of claims (see Land Use—Mining).

Beyond recreation, few other activities occur on BLM lands in the South Yuba canyon. No harvestable timber exists in the corridor, and forests beyond the canyon rim are managed to protect the riparian zones of South Yuba tributaries. There are no grazing allotments on BLM land in the river corridor.

In its 1988 Final Sierra Planning Area Management Framework Plan Amendment and Environmental Assessment, BLM stated its plan to transfer 6,000 acres in the South Yuba corridor to the California Department of Parks and Recreation to create the South Yuba State Park (see Land Ownership—South Yuba Park Project).

**Tahoe National Forest**

From its source on the slopes of Castle Peak, the South Yuba flows 26 miles through Tahoe National Forest lands. The Forest’s holdings fit into a larger land-grant checkerboard pattern of ownership.

Tahoe National Forest officially manages the South Yuba River corridor as a “streamside management zone.” In these zones, 200 foot setbacks restrict all cutting of vegetation. In steep
areas, protective setbacks are larger (see Land Use—Logging). It is assumed that the protected corridor will provide adequate habitat to riparian-dependent species. Because the Forest Service has found portions of the South Yuba eligible for National Wild and Scenic status, management guidelines for that designation apply until suitability is determined.

Above Spaulding Reservoir, the Forest Service owns 6.6 miles of river frontage. This area is managed mostly for recreation. Three popular campgrounds feature the South Yuba: Indian Springs, Big Bend, and Hampshire Rocks. In summer 1992, the Indian Springs campground alone accommodated 13,870 visitors. The campgrounds provide access to fishing, swimming, mountain biking, and hiking along the river. In the headwaters area, several ski areas operate under Forest Service special use permits. In addition, interpretive signs and the Big Bend ranger station educates visitors about the historic Emigrant Trail.

From Lang crossing below Spaulding Dam, to just above Humbug Creek, Tahoe National Forest owns about 12 miles of riverfront. The river corridor is managed for dispersed recreation, protection of riparian habitat values, and scenic values. Trails and picnic areas provide opportunities for hiking and swimming (see Recreation).

There is little logging on Forest Service lands in the river corridor. Erosion, scenery, recreation, and wildlife habitat concerns tend to outweigh the timber value (see Land Use—Logging).

There is no grazing near the river below Spaulding Dam. Above Spaulding, one allotment abuts the river where it parallels I-80 (see Land Use—Grazing).

There are 105 mining claims on Forest Service land in the river corridor, but many are seldom used. (see Land Use—Mining).

Private Land

Existing Nevada County zoning ordinances already protect the South Yuba River corridor from inappropriate development on privately-owned property. The following county zoning regulations govern land use in the river corridor.
County Zoning Regulations

**Flood plain:** Filling and grading within the 100 year flood plain are prohibited unless a civil engineer certifies that the fill material will not increase the water surface elevation of the flood plain or aggravate flooding on adjacent lands (Nevada Co. Zoning Regulations, Sec. L-II 3.18 F).

**Setbacks:** Lots with an average depth of 175 feet must have a minimum setback of 100 feet from the historical high-water mark of any stream or flood plain. For the few smaller lots that predate zoning, less restrictive requirements apply (Sec. L-II 3.18 C).

**Slope:** Development is restricted on slopes of 30 percent or greater (Sec. L-II 3.28 A).

**Sewage:** All structures must meet on-site sewage requirements (Sec. L-VI).

**Water:** All structures must have a well or other suitable water supply.

**Open Space:** Much of the river corridor is zoned as open space. Among other things, these lands are devoted to preserving natural resources and providing for outdoor recreation (Sec. L-II 19.C.1).

**Timber Management:** Some areas in the river corridor, such as the industrial timber lands, are zoned “Timberland Preserve Zones” to provide for timber-producing lands in the county. Owners of these lands are required to submit a forest management plan to be approved by the county. The plan, among other things, must specifically provide for erosion control on all disturbed lands including roads, skid trails, and landing areas. Logging must also comply with the California Forest Practices Act. Land cannot be removed from Timberland Preserve Zones until ten years after the application is made (Sec. L-II 19. B.7).
Recreation: Some areas in the river corridor are zoned "Forest and Recreation Districts." This designation "recognizes tourism as a major industry and preservation of natural forests as a major industry" (Sec. L-II 19.1).

Lot sizes: The entire river corridor is zoned for low density. The area downstream from Edwards crossing is zoned mostly for 40 acre minimum-sized lots. One section within this reach (below Highway 49) is zoned for 30 acre minimum-sized lots. Upstream from Edwards, the river corridor is zoned "Forest and Recreation Districts," or "Timberland Preserve Zones," with 160 acre minimum-sized lots. This zoning extends all the way to the river’s headwaters, with the exceptions of Washington and Kingvale. The small town of Washington is zoned for a 3 acre minimum lot size and has a small commercial zone as well. Upstream from town, within a 160 acre minimum lot size zoning area, lie approximately 25 small parcels—mostly patented mining claims—that predate zoning. Most of these parcels are over 20 acres, though the smallest is 0.8 acres. The town of Kingvale, upstream of Spaulding Reservoir on Interstate 80, is zoned for low-density, single-family residential use and for commercial tourist and highway-related services (Nevada County Zoning Maps).

Upstream from Spaulding Reservoir, private owners hold 9.4 miles of river frontage. Two timber companies, Pendola and Sierra Pacific Industries, hold 0.4 miles each, and Pacific Gas and Electric (PG&E) owns 0.2 miles. The remaining 8.4 miles of riverfront are peppered with second homes and weekend ski cabins, owned mostly by individuals from urban areas. Lodges and restaurants are also located on private lands along this reach of river, which parallels I-80.

From Spaulding Dam to the western boundary of the Tahoe National Forest, upstream from Humbug Creek, private owners hold about 10 miles of river frontage. Sierra Pacific Industries is the largest private property holder with 3 miles of riverfront. Sierra Pacific must meet State Forest Practices Act requirements, intended to protect riparian values (see Land Use—Logging). Other large land holders are First Affiliated Real Estate with 1 mile, PG&E with 0.4 miles, and the Nevada Irrigation
District—primary purveyors of water in Nevada County—with 0.4 miles of river frontage. The other 5.2 miles of privately owned river frontage are held by individuals with cabins and second homes, primarily in the vicinity of Washington.

Downstream from the Tahoe National Forest boundary, the largest tracts of private land are owned by individuals. These lands are mostly undeveloped, with the exception of a few homesites set back from the river corridor as required by local zoning ordinances. On some parcels of private land, people set up tents and stay for the summer. Private lands within the area of the planned South Yuba State Park may be purchased by the State Department of Parks and Recreation. State policy is to buy only from willing sellers, with no use of eminent domain. In cases where private owners do not wish to sell their land in fee, the DPR may seek conservation easements from willing sellers.

Land Use

Mining

Although mining once stimulated a great deal of economic activity in the South Yuba canyon, now it is done mostly on a recreational basis using panning and dredging techniques.

Miners file claims for the right to mine on public lands under the 1872 Mining law. The claims remain legally open to other public uses, such as hiking.

From Spaulding Dam to the Tahoe National Forest boundary, there are 105 known mining claims. But according to Phil Horning, Forest Service landscape architect, the number of claims is not a good indication of mining activity, which consists mostly of small scale dredging. While working on claims, miners can obtain camping permits from the Forest Service if the need is justified. Some miners live on their claims on private lands along this reach of river.

On lands owned by BLM, there is an official “mineral withdrawal” from Purdon crossing to the Tahoe National Forest boundary, so no mining claims exist in that area. Miners, however, can apply for 30-day “recreational dredging” permits. Last year, a
dozen miners participated in that activity. At BLM's request, they voluntarily closed down on weekends to lessen silt problems for downstream swimmers. No permits are required for gold panning. There are some mining claims on BLM land between Purdon crossing and Bridgeport.

On State Department of Parks and Recreation land, recreational mining with only a gold pan is permitted.

Grazing

There is virtually no grazing in the South Yuba River corridor. On Forest Service land below Spaulding, the tip of one allotment extends to the riverfront. But Forest Service range specialist Don Behrens reported that no livestock grazing actually occurs in the river corridor because the terrain is so steep. Above Spaulding Reservoir, small portions of the Rattlesnake unit of the Devils Peak allotment extend to the river where it parallels I-80. Although the allotment allows 550 sheep in the summer, Behrens said that the sheep likely stay away from the noisy highway area and river corridor.

No grazing allotments exist on BLM lands within the river corridor. No livestock grazing is permitted on state Department of Parks and Recreation land.

Logging

On Tahoe National Forest lands, trees that could yield about 22 million board feet of timber grow on steep north-facing slopes in the river canyon, but logging is heavily restricted in these areas. Scenery "retention" and "partial retention" goals that apply to the entire river corridor limit the harvesting of timber. In addition, existing "recreation opportunity spectrum"classing also restricts logging in the river corridor. The natural canyon landscape further limits logging. In areas where soils are unstable and slope exceeds 30 percent, the Forest hydrologist has extended the setbacks to 300 feet. In particularly steep terrain, such as the area below Lang crossing, setbacks could be extended to the
canyon rim. Only helicopters can harvest many of the trees growing on these steep slopes. Finally, while the Tahoe National Forest conducts its "Old-Forest and Riparian Habitat Planning Project," a temporary two-year moratorium prevents the cutting of large trees throughout the forest. The study, which examines the importance of old trees and riparian habitats for wildlife, may recommend that Tahoe National Forest protect 1,600-foot corridors around rivers from logging. According to Forest Service landscape architect Phil Horning, the Forest is doing less clearcutting and moving towards a policy of leaving "continuous forest cover." In the South Yuba canyon, because scenery, recreation, erosion, and wildlife habitat constraints override timber value, little logging occurs on Forest Service lands.

On Bureau of Land Management lands in the river corridor, no timber is harvested. Logging does occur on BLM lands beyond the rim of the canyon; 100 foot setbacks protect the riparian zones of South Yuba tributaries from excessive sedimentation.

No logging occurs on State Department of Parks and Recreation Lands.

To harvest trees in California, private landowners must meet California Forest Practices Rules requirements designed to protect riparian areas (Title 14, California Code of Regulations). Based on steepness of slopes and the beneficial uses of the river, companies must identify appropriate setbacks or "Watercourse and Lake Protection Zones" (WLPZ). In the South Yuba Canyon, where slopes are less than 30 percent, the WLPZ is 75 feet; where slopes fall between 30 and 50 percent, it is 100 feet; where slopes exceed 50 percent, it is 150 feet, or 100 feet for cable-logging operations. In the WLPZs, timber harvesters must leave 75 percent of the ground cover, 50 percent of the understory vegetation, and 50 percent of the overstory vegetation. The overstory canopy must be composed of at least 25 percent of the existing overstory conifers. Where less than 50 percent canopy exists before logging, only dead and dying trees can be cut. The Forest Practice Rules also require landowners who cut timber to submit a comprehensive timber harvesting plan for approval by the state. Rules govern erosional control on sled trails and roads, harvesting practices, silvicultural methods, and protection of wildlife and archaeological sites. Nevada County also requires private landowners with lands
designated “Timberland Preserve Zones” to comply with State Forest Practice Rules. Among other things, the county requires that logging companies specifically provide for erosion control on all disturbed lands including roads, skid trails, and landing areas (Nevada County Zoning Ordinances, Sec. I-II 19. B.7).

According to Tim Fellers of Sierra Pacific Industries (SPI), there are several million board feet of timber on company land, and at some time the company will probably harvest all of it with cable logging and helicopter techniques.

**Outstanding in Statewide and National Context**

Beyond the qualities that the South Yuba River offers to local communities in several northern California counties and to the Sierra Nevada ecosystems, the river holds significance at a statewide and national level.

**A Statewide Perspective**

California’s rivers have been intensively and exhaustively developed. Statewide, more than 1,600 large dams have been built, impounding every major river basin but the Smith. Ninety percent of the riparian or riverfront habitat—which along with wetlands rank as the most important wildlife habitat—has been lost to reservoirs, diversions, development, and agriculture. Levees and riprap (stone armoring) on riverbanks have degraded thousands of miles of waterways, including much of the lower Feather and the Sacramento rivers. Diversions have completely dried up rivers such as the San Joaquin and the Kings, with severe effects on dozens of other streams. Pollution degrades thousands more miles of waterways, as do impaired flows below dams, invasion of non-native flora and fauna, and land development. Within this context, the South Yuba offers significant values compared to most of the 103 named rivers in California.

The South Yuba flows freely for 40 continuous miles, dropping 4,173 vertical feet from the base of Spaulding Dam at
4,700 feet above sea level to Englebright Reservoir at 527 feet. This includes the middle and lower elevation zones of the Sierra that have elsewhere been developed the most. Where they are not impounded, rivers at these low elevations offer superior values for wildlife habitat and recreation because of their accessibility and temperate climate. Throughout the Sierra, only the Cosumnes River is entirely free flowing through this particular elevation zone. The Cosumnes, however, flows through much more private land. Nationwide, a trend of concern and responsiveness in wildlife management, landscape protection, and recreational activity has been growing for the lower elevation areas, and the South Yuba is a prime candidate for attention.

The South Yuba offers the best possibility in the Sierra Nevada for a continuous year-round trail through lower and middle elevations of the range.

In terms of recreation suitability, free-flowing character, length, scenery, and historic values, the South Yuba ranks high compared to the most recent California additions to the National Wild and Scenic Rivers System—the Big Sur River, Sespe Creek, and the Siskiyou River of the south central coast.

The South Yuba corridor provides vital winter range for deer—a crucial consideration as deer populations are declining statewide. The river corridor also provides habitat to other troubled California species (see Part 1—Fisheries, Plantlife, and Wildlife).

The 40-mile-long corridor from Spaulding Dam to the mouth offers not only stands of old growth conifers—increasingly scarce in California—but also a wide range of oak forests. The blue oak, one of the largest oaks and a mainstay of foothill ecosystems, is rapidly dwindling in numbers statewide.

Bald Mountain—rising straight up from the riverfront—is ranked favorably by the Department of Parks and Recreation among designated natural preserves elsewhere in the state.

Only a few rivers possess undeveloped shorelines with the degree of access afforded by the South Yuba. This is because much of the land is in public ownership, served by the six bridge crossings below Spaulding Dam, yet without paralleling roads. Few major rivers offer the South Yuba’s superb settings of deep, clean pools for summertime swimming surrounded by granite boulders.
The whitewater boating run from Washington to Edwards crossing is one of the finer runs in the state for exciting whitewater in a scenic and undeveloped setting. Gerald Meral—one of the pioneering whitewater boaters in California as early as the 1960s—regarded this run as one of the most desirable in the state. Below that reach, steeper rapids rank in difficulty with the most challenging of California rivers.

Of historic importance, the Bridgeport covered bridge is one of a kind. Miners flocked to the South Yuba during the Gold Rush, and then California’s first environmental protection ruling—the ban on hydraulic mining—occurred in response to the massive erosion at Malakoff and similar sites. Thus, the South Yuba’s role in both environmental destruction and reform ranks high.

Additional statewide significance can be attributed to the growth rate in Nevada County. With its desirable climate, relatively unspoiled environment, proximity to I-80, and small towns, this county of the South Yuba has experienced the highest growth rate in the Sierra Nevada on a percentage basis, and one of the fastest growth rates in California. The river adds to the appeal of the region and points out the need to protect remaining natural features from the pressures of development.

Perhaps most important from a statewide perspective, the South Yuba State Park Project is California’s preeminent example of a river-centered state park. Among the newest projects of the Department of Parks and Recreation, a park corridor of 21 miles will be protected. Other rivers ranking high in the state parks system are the South Fork Eel in Humboldt Redwoods State Park and the Navarro in Navarro State Park, though both are shorter than the South Yuba’s planned park. The South Yuba will thus make an important contribution to one of the finer state park systems in America. The Nevada County Planning Department’s finding that the South Yuba River is a “unique recreational resource” could well be echoed by the state.

The South Yuba in a Nationwide Context

From a nationwide perspective, the rivers and landscapes of California are unique, owing to the climate, the Sierra Nevada,
and other endemic features. Thus, every facet of the South Yuba that is significant from a statewide perspective is arguably significant at the national level as well.

In fact, many aspects of the river that might be relatively common in California are not found in any other states. For example, the South Yuba offers the idyllic river recreation opportunities of clean water, whitewater rapids, and deep swimming holes within a four hour drive of 8 million people—features that are shared by California’s American, Stanislaus, and Tuolumne rivers. Elsewhere in the United States, however, it is exceptionally rare to find a river so conducive to these forms of recreation so close to major population centers.

Only 2 percent of the nation’s 3.6 million miles of rivers and streams retain values qualifying them for National Wild and Scenic River designation, and the South Yuba clearly falls into this exclusive membership.

In this and other respects, the South Yuba stands out as a quality resource in a nation where over 60,000 large dams have been built, where channelization affects hundreds of thousands of miles of streams, where riparian damage has been wreaked on 70 percent or more of the streamfronts, and where pollution still plagues over 30 percent of the river mileage.

Relative to the 212 other rivers already designated in the National Wild and Scenic Rivers System, the South Yuba ranks high in terms of lack of development, free-flowing length, amount of recreational use, suitability for swimming and hiking, and proximity to large population centers. A feature of the South Yuba that is nearly unique is its combination of wildness and recreational access.

The climate of the South Yuba is exceptional in two regards: below Edwards crossing (and in many years, below Washington), the weather is suitable for year-round hiking with mild temperatures and frequent spring-like weather even in mid-winter. In direct contrast, the winter snowfall is extreme above Spaulding Reservoir, giving the headwaters exceptional potential for cross-country skiing. No river in the National Wild and Scenic Rivers System flows through an area of such heavy snowfall with nearby highway access.

The South Yuba River State Park is significant nationwide as a river-oriented state park. The Youghiogheny River in
Ohiopyle State Park, Pennsylvania, and the Cumberland River in Cumberland Falls State Park, Kentucky, are among the few other examples of state parks incorporating such significant river frontage. Only one National Wild and Scenic River outside California is centered around a state park—the Loxahatchee—though that park and national river in Florida is only 7 miles long. The Allagash National Wild and Scenic River is in effect a state park, where Maine administers the Allagash Wilderness Waterway canoeing corridor.

Finally, the South Yuba can be regarded as a national model for recovery from past abuse. Heavily affected during the Gold Rush, the river has reclaimed many natural qualities over the past 100 years. Benign neglect has been the key factor here. Without the development pressures that are felt on so many other rivers, the natural flood and reforestation cycles have repaired extensive damage that occurred a century ago.
Near this site, the Excelsior hydroelectric project threatened the free-flowing South Yuba River. Facing local opposition, the project eventually failed because of economic considerations, but it could be proposed again in the future.
Part 2 Water Projects and Proposals

Existing Water Development

In the modern plumbing network of the South Yuba basin, water is diverted from the upper reaches of the Middle Yuba River and from South Yuba tributaries to Spaulding Dam on the South Yuba. From there, the water is diverted southward and out of the Yuba Basin to Deer Creek and the Bear River. This complex of dams and diversions provides for hydroelectric power and water supply to irrigation and domestic users. Below Spaulding, no water projects affect the South Yuba until Englebright Reservoir, which floods the lowest half-mile of the river at its confluence with the main stem Yuba.

Headwaters Development

Extensive water development has occurred in the basin, beginning with dams to supply hydraulic mines. Built in 1859, French Dam on the South Yuba tributary of Canyon Creek may be the oldest dam still operating in the Sierra Nevada. Its waters flow to Faucherie Reservoir, then to Sawmill Reservoir, then to Bowman Reservoir, built in 1872. Canyon Creek is the natural outlet of Bowman Dam; however, the Bowman-Spaulding Canal diverts up to 320 cubic feet per second (cfs) southward to Spaulding Reservoir, with 5 cfs being released into Canyon Creek for fish and wildlife.

Jackson Meadows Reservoir, in the upper reaches of the Middle Yuba River, also stores water that is caught again 1 mile downstream in Milton Reservoir. From there it is diverted southward to Bowman Reservoir for subsequent diversion to Spaulding. Thus, flows of the Middle Yuba and Canyon Creek are sharply reduced in order to supplement the South Yuba supply behind Spaulding Dam.

Fordyce Dam is located on Fordyce Creek, a South Yuba
tributary emptying into Spaulding Reservoir. Built in the 1870s, it rises 120 feet, impounds 49,000 acre-feet of water (one acre-foot covers an acre with a foot of water), and is owned and operated by Pacific Gas & Electric.

Above Spaulding, at the South Yuba’s highest reaches, Angela Reservoir is a small impoundment at the river’s source in Donner Pass. Four miles below, Van Norden Dam, built in the 1870s, was used for mining, the railroad, and water storage to supplement Spaulding Dam. In about 1980, the dam was partially breached and abandoned by PG&E because of expenses required to make the structure safe during earthquakes.

**Spaulding Dam**

Spaulding Dam is the major water project on the South Yuba River. Built in 1913, it replaced a smaller dam built in 1892. Spaulding rises 275 feet and stores 74,800 acre-feet in a reservoir 2 miles long. Owned and operated by PG&E, the reservoir stores water that produces hydroelectricity on the South Yuba River at the dam, the Drum Canal, the South Yuba Canal, Deer Creek, and the Bear River.

PG&E’s operating license, issued in 1963 and up for relicensing by the Federal Energy Regulatory Commission in the year 2013, allows diversion of all of the South Yuba’s flow from the basin, provided 5 cfs are flowing in the river at Lang crossing, 1 mile below Spaulding Dam. Except for springtime, when releases may be cut to zero because small tributaries feed the river above Lang crossing, this means that a minimum of 5 cfs are released from the dam.

When Spaulding Reservoir fills—about eight of every ten years—it spills additional inflow to the South Yuba River. Volumes have varied from 0 to 300,000 acre-feet per year. An average year may see 75,000 acre-feet spill from the dam, mostly in April, May, and June according to PG&E hydrologists.

From the various headwater sources, water that has accumulated in Spaulding Reservoir is diverted southward to Deer Creek via PG&E’s South Yuba Canal, capable of carrying 107 cfs but usually carrying 65 cfs. From there it travels farther southward and westward to irrigate crops and provide municipal water to
communities including Grass Valley. The Drum Canal, also leading south from Spaulding, can carry 850 cfs to the Bear River basin, but it usually carries far less. South Yuba water thus ends up in a vast network that includes a dozen canals and creeks, some of it even reaching the American River via the Auburn Ravine and Folsom Reservoir.

Total diversions by PG&E and the Nevada Irrigation District average about 380,540 acre-feet a year from the Drum Canal and 60,610 acre-feet from the South Yuba Canal. Total diversions from Spaulding are about 441,150 acre-feet a year, while the lower South Yuba River carries 229,960 acre-feet in an average year according to 1970-91 U.S. Geological Survey data. On average, 66 percent of the South Yuba’s total flow is diverted at Spaulding.

**The Nevada Irrigation District**

Formed in 1921, the Nevada Irrigation District (NID) owns and operates the water supply network on the Middle Yuba and Canyon Creek that is diverted from Bowman Reservoir. The NID’s ten major reservoirs in the Yuba, Deer Creek, and Bear River basins store 250,280 acre-feet and include the following.

<table>
<thead>
<tr>
<th>Dam</th>
<th>Stream</th>
<th>Height (ft)</th>
<th>Reservoir Size (ac-ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jackson Mdw</td>
<td>Middle Yuba</td>
<td>195</td>
<td>69,205</td>
</tr>
<tr>
<td>Bowman</td>
<td>Canyon Creek</td>
<td>171</td>
<td>68,510</td>
</tr>
<tr>
<td>Rollins</td>
<td>Bear River</td>
<td>242</td>
<td>66,988</td>
</tr>
<tr>
<td>Scotts Flat</td>
<td>Deer Creek</td>
<td>175</td>
<td>48,547</td>
</tr>
</tbody>
</table>

NID provides untreated water for agricultural irrigation to about 28,000 acres and operates a domestic water system encompassing 10 treatment plants that provide water to 57,000 people. It also operates seven hydroelectric plants, with a total capacity of 85 megawatts, that produce an average of 375,000 megawatt hours of energy per year for sale to PG&E.

According to the county’s Master Environmental Inventory, water sales for NID have ranged in recent years from 138,155 acre-feet in 1990 to 57,408 acre-feet in the drought year of 1977. In the 1990 Update to the *Urban Water Management Plan,*
NID estimated that 95 percent of water sales is for untreated water or agricultural use, but growing urbanization is expected to decrease untreated water sales to 90 percent by the year 2010.

**Other Water Supplies**

Other minor suppliers of water in western Nevada County include Nevada City, delivering water from Little Deer Creek; Grass Valley, with raw water purchased from NID; Washington County Water District, serving the small community of Washington from Canyon Creek near the South Yuba; and the San Juan Ridge County Water District, serving about 22 irrigation customers with 60 acre-feet a year from Shady Creek, a South Yuba tributary that enters the river below Highway 49.

**Englebright Dam**

Downstream, on the main stem of the Yuba, Englebright Dam rises 261 feet and impounds 70,000 acre-feet of water in a 10-mile-long reservoir, flooding the lowest half-mile of the South Yuba River. In operation since 1939, this Army Corps of Engineers Dam stops salmon and steelhead from ascending the South, Middle, and North Yuba rivers.

The project was built for "debris control"—to catch silt eroding from old hydraulic mines of the Yuba basin. In 1990, the Army Corps reported that Englebright "has not been used for that purpose because no upstream mining activity has occurred since project completion." Because hydraulic mining ended in the 1880s, Englebright may be one of the more under-utilized large dams in the Army Corps' entire nationwide estate. PG&E produces some hydroelectric power with reservoir water, and the flatwater is used for motorboat recreation. Thus, the salmon and steelhead runs were blocked by a dam that has never served its authorized purpose—because there really wasn't any purpose—and whose only redeeming features are the production of some hydroelectric power by PG&E and some flatwater recreation.
The South Yuba is already a hard-working river. Spaulding Dam was built in upper reaches for hydroelectric power and water supply, and the Army Corps of Engineers built Englebright Dam, shown here, on the main stem just below the South Yuba confluence.

The Middle and North Yuba

Other dams and water projects are located in the Middle and North Yuba basins, each having one major dam and other minor ones. Basinwide, 20 reservoirs with capacities of 1,000 acre-feet or more have been built, and 20 hydroelectric plants are in operation. Chief among these is New Bullards Bar Dam, constructed by the Yuba County Water Agency (YCWA) on the North Yuba. When completed in 1969, this was the largest double curvature, thin shell arch dam ever built. The large reservoir holds 961,300 acre-feet. The YCWA built the dam to supply water to Yuba County irrigators and other local water uses, and also operates it for power production under an agreement with PG&E. Flatwater recreation is enhanced by keeping the reservoir as full as possible in the summer. During dry years, New Bullards Bar water has been sold by the YCWA for export south of the Yuba basin.
A Productive South Yuba River

With two major reservoirs and the diversion of much of the upper basin’s flow, the South Yuba is clearly a productive river. In addition to Spaulding and Englebright dams, two small dams have been built on the upper South Yuba, and a total of 26 small and large dams have been built in the South Yuba basin (many of these are minor structures at the outlets of formerly natural lakes). Twelve hydroelectric plants operate in the South Yuba basin. The basin has been intensively developed and contributes more than its share to meet the water and power needs of California.

Even while the river provides so much water and power, a major section of the South Yuba retains extraordinary free-flowing qualities. Ironically, while the watershed has been developed with dams and diversions in a thoroughness overlooking little of hydrologic importance, the actual corridor of the South Yuba remains largely undeveloped, wild, and natural.

Large Dam Proposals

Neither the Army Corps of Engineers, Bureau of Reclamation, state Department of Water Resources, nor private developers have ever advanced a serious proposal for large dams on the South Yuba since the construction of Spaulding. No local or county water development entity has ever reached the application or permit phase, or even sponsored a feasibility study. It is not that these agencies did not want to build dams or that they overlooked the South Yuba — history provides ample evidence to the contrary — but rather that the South Yuba simply has no feasible sites or water flows to merit consideration by any prudent public body or private investor. The only dam ever authorized for the Yuba Basin was the Marysville Project, below the South Yuba on the main stem, and it was never built.

The Yuba County Water Agency (YCWA) showed an interest in the South Yuba River in the late 1980s following the 1986 flood and after the agency began to receive revenues from the sale of water during the 1987-92 drought. Organized to develop and manage water in the lower Yuba River area, the board is
composed of all five county supervisors and two other elected members.

In 1988, the YCWA contracted an engineering firm—EBASCO Services Inc.—to study the Yuba River basin. A related firm, EBASCO Contractors, Inc., had already been involved with the YCWA in the ill-fated Wambo Bar Dam proposal on the North Yuba. The firm was directed to identify “buildable” flood control projects that would also provide storage for water supply. EBASCO was requested to pursue possibilities on the South Yuba River. In 1989, the firm identified four dam sites having “high potential for being buildable.” Marysville Dam and Long Bar Dam on the main stem Yuba, along with Humbug and Holbrook Flat dams on the South Yuba, were identified for “prefeasibility” studies. A summary of these and other sites follows.

**Humbug Dam Site**

This 450-foot-high dam would be located 3 miles upstream from Edwards crossing, below the mouth of Humbug Creek, and would form a reservoir reaching 10 miles to the village of Washington. A reservoir capacity of 206,000 acre-feet would provide flood control space of 80,000 acre-feet. EBASCO reported that this would provide for 130-year flood protection in the Marysville area, including Linda and Olivehurst. This estimate assumed that a “credit” of 60,000 acre-feet could be given to the incidental space normally available in upstream reservoirs elsewhere in the basin.

This “credit” means that benefits claimed for flood control include the benefits already existing at upstream reservoirs. Though they were not built for flood control, several reservoirs may have some space available for flood storage. These benefits, accounting for 43 percent of the claimed flood control benefits of Humbug Dam, are not attributable to the project, and the accounting procedure is not followed or permitted by the Army Corps of Engineers in analyzing its flood control projects.

Further undermining the claims of flood control benefits, the EBASCO report referred to the upstream reservoirs on which the “credit” is based as having “only negligible influence on large floods that are preceded by appreciable runoff.”
Identified by the YCWA as potentially "buildable," the Humbug Dam would flood this section of the South Yuba. The Army Corps found no feasible dam sites in the basin.

EBASCO's claims of flood control benefits totaling $1.5 million per year did not assume that levees in the Marysville area—where all of the flood damage occurs—would be upgraded. In fact, they are being upgraded to provide 200- and 150-year protection, with benefits that will cancel the alleged Humbug flood control benefits.

To gain a YCWA water supply from the dam, a 6.5-mile-long-tunnel under the San Juan Ridge would connect Humbug Reservoir to the existing Our House Dam on the Middle Yuba River. From there, 169,200 acre-feet per year of the South Yuba would be diverted to New Bullards Bar Reservoir on the North Yuba River.

A firm yield of 27,000 acre-feet for the drought of 1976-77 and a yield of 83,000 acre-feet for the drought of 1929-35 would be provided. (The amount of water in the dry years of 1976-77 is often used as a base-line for evaluation of water projects.) A 1.18-megawatt powerplant would be built at the dam to utilize the "fish release"—the quantity of which was undocumented in the report—and produce 0.28 megawatts of dependable capacity and 7,640
megawatt hours per year of baseload energy.

The 1989 cost estimate was $224.6 million—quite high relative to large dams that have been built—and it did not include the cost of interest, which at 8 percent would double the cost of the dam in only nine years. The best that EBASCO could say about the dam was that it would provide "limited" flood control, power and water supply benefits, and that it was potentially "buildable."

**Holbrook Flat Dam**

This 400-foot-high dam would be sited 2 miles upstream from Washington and would flood 5 miles of river with a reservoir of 161,000 acre-feet. Flood control storage of 40,000 acre-feet would provide 100 year protection in the Marysville area. As with the Humbug project, a "credit" of 60,000 acre-feet would be given to space in reservoirs elsewhere in the Yuba basin. Once again, this "credit" refers to flood storage already existing upstream, in this case accounting for 60 percent of claimed flood control benefits of the Holbrook Flat project. EBASCO claimed $1.1 million of annual flood control benefits, but, as with the Humbug site, these did not account for the levee improvements that will be in place long before any dam will be built. This will render any flood control claims for the dams to be inconsequential.

One option for the plan included a new tunnel to divert water from Holbrook Dam southward to the Bear River, with the goal of reducing flood flows on the main stem Yuba. The Army Corps had previously studied a similar diversion plan, except that their plan would have simply modified existing structures instead of building a new dam and tunnel. Even so, the Corps plan was unfeasible, and in 1990 was judged by the Corps to be not even worth considering.

Holbrook Flat Dam would be operated in conjunction with a 90-foot-high dam at Humbug. From there, South Yuba flows stored in Holbrook Dam would be diverted by tunnel to the Middle Yuba and then to the North Yuba for use as a YCWA water supply in New Bullards Bar Reservoir. This diversion would carry up to 200,000 acre-feet per year.

However, only 292,960 acre-feet of water flows in the lower South Yuba in an average year, and this was measured well below the Humbug diversion site. Only minor tributaries
South Yuba River Proposed Water Projects

- Bullards Bar Res.
- Lohman Ridge Tunnel
- Proposed Humbug Tunnel
- Purdon Crossing
- Edwards Crossing
- South Hwy. 49
- Excelsior Project
- Miner's Tunnel Project
- Englebright Res.
- Nevada City
contribute inflow to the South Yuba between Spaulding and Humbug. Furthermore, in one year out of five, Spaulding does not spill anything, and when it does, flows to the South Yuba average in the 75,000 acre-feet range according to PG&E hydrologists. This data raises serious questions about the proposed South Yuba dams' ability to divert 169,200 and 200,000 acre-feet respectively, even if small amounts of water were released to the river.

Two powerplants with the Holbrook project would total 1.38 megawatts, producing 9,700 megawatt hours in an average year. The firm water yield would be about the same as Humbug—27,000 acre-feet for 1976-77. In 1989, the cost of the project was estimated at $262.2 million, which, as with Humbug, excluded interest.

In spite of the preliminary and questionable nature of these dam sites, the YCWA in August 1989 appointed a three-member committee to explore the possibility of buying land in Nevada County for the dams and reservoirs. "What the agency would do if it did move forward would be the acquisition of private property," said engineer-administrator Donn Wilson, as quoted in an August 15, 1989 Grass Valley Union article. "Ultimately, if a specific project is identified and authorized, there would have to be acquisition of public lands." Regarding the power of condemnation, Wilson added that the Agency "would not exercise it at this point." In a 1993 interview, Wilson reported that the committee was not a standing committee of the Agency and had never done anything regarding acquisition of land. He said that YCWA acquisition had been discussed as a way of precluding the establishment of the South Yuba River State Park, which was perceived by board members as an impediment to new dams.

Because of a stated flood control interest, the YCWA officially opposed BLM's plan to transfer land to the California Department of Parks and Recreation for the South Yuba River State Park. BLM agreed to wait until a YCWA "flood control study" was completed, with a January 1991 deadline. As of January 1993, no such study had been undertaken by the YCWA beyond the EBASCO report. The BLM district manager made official his decision to transfer the lands for the state park.
Edwards Crossing Dam

EBASCO identified other sites on the South Yuba, even less feasible than Humbug and Holbrook Flat, but eliminated them from further consideration. Two sites at Edwards crossing would each be 620 feet high. This diminutive stream would thus be the site of one of the taller dams in the United States. One site would create a 600,000 acre-foot reservoir and the other would form a 460,000 acre-foot reservoir—both remarkably small for the height of the dams. Both were rejected for their “environmental” impacts. EBASCO stated that the dams would flood primitive-type recreation areas, including 6 miles of the National Recreational Trails System, and 13 miles of the South Yuba recommended for consideration in the National Wild and Scenic Rivers System. Though this concern was limited to the Edwards dams, most of the same losses would occur with the Humbug and Holbrook sites as well. One Edwards site would flood the town of Washington.

Studying Edwards crossing sites in 1977, the Army Corps of Engineers reported a benefit cost ratio of 0.2 to 0.5, meaning that for every dollar spent, a return of 20 cents to 50 cents would be realized by somebody.

In their reexamination of South Yuba reservoir sites in 1990, the Corps recommended no further study, and reported, “Development at Edwards crossing would inundate a reach popular for its scenic beauty and recreational opportunities.”

Marysville Dam

Though located outside the South Yuba basin, the proposed Marysville Dam would inundate the lowest reaches of the South Yuba, with the larger of two alternatives flooding the South Yuba to elevation 560—about half a mile above Bridgeport. This complex of three dams was authorized in 1966 but was dropped from consideration and is now inactive.

The main dam, located at Parks Bar, would have a maximum height of 420 feet forming a 514,000 acre-foot reservoir on the main stem Yuba below Englebright Dam. An auxiliary dam would be located on Dry Creek, with a channel connecting the two reservoirs. Another 122-foot-high reregulating dam would be built.
downstream of the main dam. In all, 20,000 acres would be flooded, including 47 miles of the Yuba River and tributary creeks. Total flood control capacity would be 240,000 acre-feet. When analyzed in 1983, the project would have displaced 500 people—a figure that has quite likely grown.

Under the 1986 Water Resources Development Act, projects are to be deauthorized automatically if no funding is appropriated for them within five years. For Marysville Dam, no funds were appropriated since fiscal year 1979, clearly including a five year period following the 1986 Act. In spite of this, formal deauthorization procedures had not begun as of February 1993. The only ostensible argument for not automatically deauthorizing the dam, as required by law, is that the Corps is spending money on a feasibility study of levees downstream from the Marysville site, though it is clear that none of the money is being spent on any part of the Marysville project.

Other Main Stem Projects

Located just below the existing Englebright Dam, this proposal calls for a dam that would inundate Englebright and flood the South Yuba for some distance above Bridgeport. The Corps estimated that the 1 million acre-foot Narrows Project would cost $1.24 billion and have a benefit cost ratio of 0.6.

Alternate dam sites in the area below Englebright include Parks Bar, Timbuctoo, and Long Bar. In 1990, the Corps estimated that a 514,000 acre-foot Parks Bar project (without the rest of the Marysville Project) would cost $810 million, with a benefit cost ratio of 0.3. In a 1993 interview, the YCWA’s Donn Wilson stated that the agency was not spending money on any of the new sites. By nature of their consideration in the 1990 Reconnaissance report, all of these lower river sites were regarded by the Corps as more feasible than any sites on the South Yuba.

EBASCO recommended further study of a 100-foot-high dam at Long Bar, 14 miles above Marysville at the Highway 20 bridge. This reservoir would not flood above the existing Englebright Dam. The Long Bar Dam would have very little flood control space, but would possibly be combined with a bypass canal—presumably to be built by the Army Corps of Engineers—to carry flood water to the Bear River.
Englebright Dam Extension

Yet another proposal would raise the existing Englebright Dam and flood lower reaches of the South Yuba. Under one plan, flood flows of up to 87,000 cfs would be diverted to the Bear River through an 18-mile diversion system. In 1990, the Army Corps reported that extensions of 10, 20, or 30 feet added to the height of Englebright were all uneconomic, and that no further investigation was warranted.

Wambo Bar Dam

This dam site on the North Yuba River was planned by the YCWA in the 1980s. The dam would have flooded the North Yuba with a 70,000 acre-foot reservoir above New Bullards Bar Dam. The site was ultimately rejected because the $160 million project proved to be uneconomic. Since it is not on the South Yuba River, Wambo is not analyzed here, though it is significant that this proposal was pursued by the YCWA long before any consideration was given to the South Yuba sites, presumably because of its greater economic feasibility.

Summary of Proposed Dams

After considering various sites for the YCWA, EBASCO identified four possible projects: 1) Marysville Project, with dams at Parks Bar and Dry Creek, 2) Long Bar Project, with an Army Corps of Engineers bypass facility to divert water to the Bear River, 3) Humbug Dam, and 4) Holbrook Flat Dam.

In spite of the considerable shortcomings of the dam proposals outlined in this section of the report, some decision-makers still regard the YCWA proposals for the South Yuba River seriously. Because of that fact, the following sections of this chapter further investigate the questions of feasibility, need, cost, impacts, and alternatives.
Flood Control Considerations and Alternatives

Because flood control is the primary interest expressed by the Yuba County Water Agency in considering new dams on the South Yuba, careful consideration of this important issue is in order.

With almost no development existing along the South Yuba, there is no local reason to invest in flood control facilities or to sacrifice otherwise valuable sections of river. Downstream land development, however, is located in the flood zone near the confluence of the Yuba and Feather rivers. Low lying properties, including sites in Linda and Olivehurst (all in Yuba County and referred to in this report as the Marysville area), have been flooded repeatedly, most notably in 1950, 1955, 1964, and 1986. After the floods—all but the one in 1986 occurring before New Bullards Bar Dam was built—most buildings were renovated and new development has continued to be added in the flood areas. The important question is how to provide effective flood protection to this area most economically. If possible, this would be done while avoiding adverse, costly, and irreplaceable losses elsewhere.

South Yuba Flood Control Studies

Affecting the Marysville area and the Sacramento Valley, a series of levees, pumping plants, bypass floodways, and related facilities have been built as part of the Sacramento River Flood Control Project, authorized in 1917. Since 1931, additional studies have been conducted by the Army Corps of Engineers to determine how more protection to this zone of increasing land development might occur. All of these studies have found dams on the South Yuba to be unfeasible. The Corp’s 1990 Yuba River Basin Investigation Reconnaissance Report stated, “None of the reservoir alternatives was feasible.”

The Corps did consider dam sites on the South Yuba. “All the locations were too disruptive environmentally and too
expensive economically," stated Walter Yep, Chief of Planning for the Corps. "The costs would be massive, so the sites were dropped entirely. We cannot foresee a project on the South Yuba River."

A survey by the California Assembly Natural Resources Committee staff in 1987 likewise found that all South Yuba project proposals "would provide minimal or no flood control benefits." Furthermore, far better options for flood control are available.

The South Yuba's Contributions to Flooding

Impacts of flooding the South Yuba under reservoirs would be severe, costs would be high, and other problems would be plentiful, but a major reason that South Yuba dam sites are unfeasible is far simpler: there are not enough flood flows in the river to justify a dam, especially one as high in the basin as the Edwards, Humbug, or Holbrook Flat sites. The drainage area just below Englebright Dam, for example, is 1,108 square miles—four times that of the Humbug site on the South Yuba.

Only 10 percent of the flood flow in the Marysville area in February 1986 came from the South Yuba, with 90 percent coming from the rest of the Yuba basin and the Feather River basin.

The South Yuba basin accounts for about 343 square miles of the total Yuba River basin's 1,350 square miles, and accounts for 17 percent of the normal runoff of the Yuba at the river's mouth.

When the main stem Yuba below Englebright was cresting at an average of 87,200 cfs on February 19, 1986, and the Yuba River at the Marysville gage peaked at 111,900 cfs, the South Yuba at Jones Bar (12 miles below the Humbug site) was flowing at only 17,400 cfs.

Levees

Considerable damage occurred during the flood of 1986. The reason for the damage was not the South Yuba River. The reason was that the town's levee broke. This occurred as water levels were receding. At 6:10 PM on February 20, the south levee of the Yuba River failed, allowing 10 feet of water to flood the
low-lying Linda and Olivehurst area, and causing the evacuation of 20,000 people and damages of $95 million.

The levee had a design capacity of 120,000 cfs, increasing to 180,000 cfs when the concurrent flow of the Feather River was less than 180,000 cfs. The Yuba was flowing at 75,810 cfs at the time of the levee break. The levees, in fact, had survived much higher flows—160,000 cfs in 1955 and 180,000 in 1964. In none of these cases did flows overtop the levees. Flows were running 63 percent of the design capacity of the levee when it failed. A secure levee would clearly have prevented the damages.

Prompted by the 1986 failure, the Army Corps conducted another in a long line of flood studies for the area and concluded a year later that levee improvements were the most effective and economic measure to be taken. The Corps’ *Yuba River Basin Investigation* in 1990 recommended levee improvements, and feasibility studies were underway in 1993 for levees offering protection from the 200-year and 150-year frequency storms—exceedingly good protection relative to many other flood control projects in the nation.

Prepared a year earlier, the YCWA’s EBASCO report did not recognize that improvements to the levees would be made: “Unless the structural integrity of the existing levee system can be
restored, it would be most desirable to develop upstream storage projects or any other measures such as flood bypass.” The important addendum to this statement is that the structural integrity of the levees is being restored. Corps officials indicated during the 1993 feasibility studies of the levees that there was little chance that “structural integrity” would be a problem. The improved levees, offering 200-year and 150-year protection, are superior to the EBASCO estimation of protection “in excess of a 100-year flood event” through “new multipurpose storage projects.”

It is understandable that the YCWA would not ask EBASCO to consider levees, since the Corps was already doing that at no charge, but it is not understandable why the effects of the levees would now be omitted from the flood control benefit claims of EBASCO’s new dam proposals. The levee improvements reduce new dam benefits almost to zero, though they were not much to begin with, given their dependence on the “credits” claimed for already existing dams upstream (see Part 2—Large Dam Proposals).

YCWA administrator Donn Wilson said in a 1993 interview, “People have no confidence in levees because they’ve seen them fail too many times. Some of the Water Agency board members harbor that feeling very strongly.” It may be instructive to note that the 1986 levee failure occurred in a segment of the levee that had not been refurbished in the early 1960s when 3 1/4 miles of adjoining sections of levee were refurbished.

The Operation of Englebright Dam

In 1990, the Corps also recommended the deregulation, or revised management, of Englebright Dam. It was never useful for its authorized purpose of “debris control,” and its benefits for nearly 50 years have been limited to hydroelectric power and “incidental” flatwater recreation, while ample reservoir space for recreation can be found in all directions, including 4,790 acres at New Bullards Bar Reservoir and 15,800 acres at Oroville Reservoir.

Revised operation schedules of Englebright could provide up to 70,000 acre-feet of flood protection, according to the Corps, but existing hydroelectric facilities would be affected. The Corps
reported that reoperation of Englebright, in combination with reoperation of New Bullards Bar, could “offer a strong potential of providing flood control benefits, as well as meeting other water resource needs at minimal costs associated with non-structural operational changes.”

On further analysis, the Corps determined that even the Englebright reoperation—involving little if any physical changes to the dam—was not worth pursuing relative to the projected benefits of simply improving the levee system. The Englebright reoperation was considered too economically marginal to warrant further study. The Corps’ Chief of Planning stated, “We’re trying to maximize the use of federal dollars. The levee project is clearly the most effective and affordable thing to do.” According to the Army Corps’ project engineer, Adrienne Carter, “There is no apparent reason that improved levees cannot provide adequate protection to the area.”

The next step for flood control plans for the Linda-Olivehurst area, after the Corps’ 100 percent federally funded reconnaissance study in 1990, was a feasibility study, which by law requires a share of local funding. The YCWA secured support from the State Reclamation Board, and together the state and YCWA provided the required local share of money. The Reclamation Board deferred to the Army Corps’ analysis recommending that the Englebright reoperation be dropped from the study, and the three entities agreed to proceed with a feasibility study of levee improvements only.

Flood Control In Existing Upstream Reservoirs

Flood control potential may exist at existing upstream reservoirs owned by PG&E and NID. The EBASCO estimate of unimpaired South Yuba flow (an estimate of the flow assuming there had been no dams or diversions) during the 1986 flood suggests that a 13,000 cfs reduction in flows may have occurred. The Army Corps’ Report on the February 1986 Floods indicates that 85,800 acre-feet were stored in upstream reservoirs. Development of agreements with upstream dam operators could possibly ensure the availability of some flood storage behind those existing dams.
Management of New Bullards Bar During the Flood

Irrespective of revised operations at Englebright and other dams, improvements in flood control protection through modified reservoir management are possible. Despite National Weather Service reports in February, 1986 that were described by the California Department of Water Resources as "exceptionally accurate and of great value," and in spite of the fact that floods were predicted based on "similarities" of the 1986 storm to that of December, 1964, New Bullards Bar Dam was managed for increased storage almost until the peak release of February 19. Flood control storage potential for the reservoir appeared to be far from effectively utilized for a significant period leading up to the 1986 flood crest.

Using inflow, outflow, and storage records from the flood event, it is possible to reconstruct what the operation of New Bullards Bar would have looked like had the procedures earlier specified by the Army Corps been followed. By holding back water early in the flood, the reservoir managers used up flood

![Available Space at New Bullards Bar: Actual vs. Specified Operation](image-url)

Available Space at New Bullards Bar: Actual vs. Specified Operation

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storage space that would have been critical had the flood conditions continued or been more extreme. A total of 96,000 acre-feet of flood storage were thus prematurely filled at New Bullards Bar in February 1986. This alone is a greater amount of flood water than a new dam on the South Yuba would hold. The 1986 situation is illustrated on the following graph.

The YCWA’s Donn Wilson explained that New Bullards Bar was prematurely filled under the advice of the Army Corps. The Corps was unable to use a gauge on the Yuba River at Marysville, and made a judgement call that New Bullards Bar storage would not be needed and should be used early in the flood, presumably in order to allow flood crests from other rivers to subside before releasing large flows from the North Yuba. One post-flood analysis points to the same strategy apparently being followed on the Feather River at Oroville Dam. The point of this discussion is not to investigate any mistakes that might have been made, which is beyond the scope of this report, but simply to show that New Bullards Bar could have held much more flood water than it did, had the prescribed operations been followed.

Reoperation of New Bullards Bar Dam

Beyond these considerations of reservoir management during the 1986 flood, the ongoing management of the existing reservoirs could clearly be improved for added flood control effectiveness. If the YCWA were truly interested in providing additional flood control on the Yuba River, it could reallocate storage in New Bullards Bar Reservoir for this purpose. The YCWA operates the dam with a large 961,000 acre foot capacity, only 170,000 acre-feet of which is designated for flood control reservation. By comparison, Folsom Dam on the American River, operated by the Bureau of Reclamation, is about the same size and is operated for 400,000 acre-feet of flood control. Because the YCWA has large surpluses of water for local uses even during drought years, and in fact sometimes sells large amounts of water outside the basin, revised management of New Bullards Bar for better local flood control may be in order, especially if the agency feels compelled to consider flood control as a justification for costly and damaging projects outside Yuba County’s jurisdiction on the South Yuba River.
Flood Plain Management

Flood damage occurs, of course, because development is located in the flood zone. While there are many reasons for this, and while protection of development in flood zones is indirectly encouraged by public works projects such as levees and dams, flood plain management is also considered a priority of the federal government in coping with flood hazards. The National Flood Insurance Program requires that local communities enact land use ordinances to minimize further flood damages in order for existing property owners to be eligible for subsidized flood insurance, and in order for banks to issue federally insured mortgages for new development in flood areas. In spite of federal directives for flood plain management since the early 1960s, development has continued on some flood plains without adequate local regulation.

Lands behind the levee system in the Linda area are not zoned as flood-prone in spite of the fact that the existing, repaired, and restored levees offer protection from only a 70-year flood event.

The Federal Emergency Management Agency, responsible for the National Flood Insurance Program, has not recognized this hazardous risk area as requiring flood zoning. The normal requirement is to regulate the 100-year flood zone as a prerequisite to flood insurance participation. This is the case in virtually every other area of the nation that participates in the Flood Insurance Program. But the area south of the Yuba River levee has no restrictions on building and no requirements for flood-proofing. New development proliferates in that area.

Nevada County, in contrast, requires that homesites be located above the 100-year floodplain, or that they be adequately flood-proofed.

Yuba county's dire economic straits may be a reason for state and federal assistance in protecting development that already exists, but additional development sited in areas prone to floods may only exacerbate those problems by causing yet higher flood losses, damage to public facilities, costly rescue and recovery efforts, and a continued cycle of local economic problems.
If protection by levees is not considered adequate, then the county, local communities, and the Federal Flood Insurance Program should recognize the need to regulate new development more effectively—not to eliminate it but simply to steer it away from flood zones and onto safer ground in the region—thus avoiding the otherwise inevitable economic crises of ever-increasing flood damage.

In 1993, the Marysville Levee Commission, local reclamation districts, and the YCWA took important steps in beginning restoration work on the local levees, though this work will not improve protection for any more than the 70-year flood in many areas. Further improvements are dependent on the ongoing Army Corps feasibility study and the expected levee raising, which will take longer to accomplish.

The main point here is not that Yuba County communities are remiss in failing to regulate areas subject to 70-year flood hazards. Indeed, the Federal Emergency Management Agency has agreed to this inconsistency with its National Flood Insurance Program. The main point here is rather that the responsible local agencies might well consider taking prudent steps, in keeping with nationwide standards for flood zoning and protection, before they advocate costly, destructive, ineffective solutions in other counties—solutions such as those the YCWA has identified in construction of dams on the South Yuba River.
# Summary of Flood Control Considerations

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>New dams on the South Yuba</td>
<td>- Only a slight effect on floods.</td>
</tr>
<tr>
<td></td>
<td>- Benefits negated by levees.</td>
</tr>
<tr>
<td></td>
<td>- Half of claimed benefits due to existing upstream reservoirs.</td>
</tr>
<tr>
<td></td>
<td>- Prohibitively expensive.</td>
</tr>
<tr>
<td></td>
<td>- Permanently flood 10 miles of canyon for incidental flood reduction downstream.</td>
</tr>
<tr>
<td>Levee improvements.</td>
<td>- Effective for the 150- to 200-year flood.</td>
</tr>
<tr>
<td></td>
<td>- Inexpensive.</td>
</tr>
<tr>
<td></td>
<td>- Can be built quickly.</td>
</tr>
<tr>
<td></td>
<td>- Federal government will pay for much of the cost.</td>
</tr>
<tr>
<td></td>
<td>- Minimal environmental impact.</td>
</tr>
<tr>
<td>Specified operation at New Bullards Bar.</td>
<td>- Would have resulted in 96,000 more acre-feet of storage available in the 1986 flood.</td>
</tr>
<tr>
<td>Revise operation at New Bullards Bar.</td>
<td>- Great amounts of additional flood storage would be available.</td>
</tr>
<tr>
<td>Revised operation of Englebright Dam.</td>
<td>- Additional flood storage available without modifying the dam.</td>
</tr>
<tr>
<td>Flood plain management</td>
<td>- Will prevent flood vulnerability from getting worse.</td>
</tr>
</tbody>
</table>
Water Supply Considerations and Alternatives

Officials from both the Yuba County Water Agency and the Nevada Irrigation District have voiced concerns regarding protection of the remaining undeveloped reaches of the South Yuba River. Their concern has been that new dams may be needed for future water supply. Therefore, this issue deserves serious consideration.

The Export of Surplus Water

Yuba County, with a population of 60,500 (compared to Nevada County’s 83,100), lies downstream from the South Yuba River, and its major population center lies near the confluence of the Yuba and Feather rivers.

The county’s water rights include the right to directly divert 1,550 cfs from the lower Yuba River for irrigation and to divert to storage 961,300 acre-feet in New Bullards Bar Reservoir. The YCWA provides about 288,000 acre-feet a year to all its member water districts.

The currently developed and available water supplies of the agency far exceed local needs. The agency has rights to about five times as much water as its irrigation customers use, according to a June 3, 1990 Sacramento Bee article, though the firm yield would be much lower.

Through the drought years of 1987-91, the Agency sold large quantities of water for use outside the county. Total transfers to areas south of the county totaled 725,700 acre-feet for the five-year period, generating an income of $34,108,000 to the Water Agency, as shown on the following table. Another 87,000 acre-feet were sold in 1991 by irrigation districts served by the Water Agency, for a total transfer from the Yuba basin of 812,700 acre-feet. This brings the average Yuba basin transfer to 162,540 acre-feet per year for the 1987-91 period.
## Water sold by YCWA

<table>
<thead>
<tr>
<th>Year</th>
<th>Recipient</th>
<th>Acre-Feet Transferred</th>
</tr>
</thead>
<tbody>
<tr>
<td>1987</td>
<td>DWR</td>
<td>83,100</td>
</tr>
<tr>
<td>1988</td>
<td>DWR</td>
<td>122,000</td>
</tr>
<tr>
<td>1989</td>
<td>EBMUD*</td>
<td>0</td>
</tr>
<tr>
<td>1989</td>
<td>City of Napa</td>
<td>7,000</td>
</tr>
<tr>
<td>1989</td>
<td>DWR</td>
<td>200,000</td>
</tr>
<tr>
<td>1989</td>
<td>DFG**</td>
<td>30,000</td>
</tr>
<tr>
<td>1990</td>
<td>Napa</td>
<td>6,300</td>
</tr>
<tr>
<td>1990</td>
<td>DWR</td>
<td>109,600</td>
</tr>
<tr>
<td>1990</td>
<td>Tudor***</td>
<td>3,000</td>
</tr>
<tr>
<td>1991</td>
<td>Napa</td>
<td>7,500</td>
</tr>
<tr>
<td>1991</td>
<td>DWR</td>
<td>157,200</td>
</tr>
<tr>
<td></td>
<td><strong>Total:</strong></td>
<td><strong>725,700</strong></td>
</tr>
</tbody>
</table>

**Total YCWA Revenue:** $34,108,000

DWR: Department of Water Resources

* East Bay Municipal Utilities District did not exercise option to divert 66,000 acre-feet of water approved for transfer.

** Department of Fish & Game received a portion of water approved for EBMUD.

***Tudor Mutual Water Company and Feather Water Company

Source: State Water Resources Control Board

During one year, the YCWA received $45 an acre-foot for water sold to the Department of Water Resources for the State Water Project, compared to $17 that state contractors normally paid for water from the DWR during non-drought years. In 1991, the State Water Bank bought water for $125 an acre-foot, and acquired more from the YCWA than from any other single source.

Highly controversial, water marketing is new in California, where a complex of laws, regulations, and traditions have made it difficult to sell water from one area to another. Proponents of marketing have argued that it can relieve demands without costly and damaging new dams and diversions. However, support among many advocates of marketing evaporates when yet more dams and diversions are proposed not for local needs but for revenue through water sales. Yuba County has considered using its marketing income to build more dams and divert more flows from the South Yuba River. But more immediately, the YCWA wisely used revenues to repair levees, study levee improvements, improve
community water systems, and upgrade irrigation ditches. The Agency planned to spend additional funds on levees and expansion of water distribution systems, in order to lure industry and jobs to the county.

In testimony before the State Water Resources Control Board in 1992, YCWA engineer-administrator Donn Wilson said that the transfers had been possible for three reasons: 1) PG&E had foregone contracted winter and spring generation quotas, 2) for most of the drought, the Yuba basin had experienced higher runoff than most rivers, and 3) because of past lack of funds, the YCWA has not yet been able to construct irrigation systems to some areas of the county. The Agency’s board of directors passed a resolution in 1987 providing that all money from the temporary transfers be deposited in a restricted fund to be used only for water-system or flood-protection improvements within Yuba County, except for $1.00 per acre-foot to be transferred to the Water Agency’s general fund.

In its Staff Report: Lower Yuba River, the State Water Resources Control Board in 1991 reviewed the YCWA water rights and the sales to agencies outside Yuba County. “Based on the above factors, it appears that Yuba County Water Agency’s storage capacity at New Bullard’s Bar is sufficient to meet ultimate projected needs and still have surplus water remaining after projected needs are met.”

One further illustration of the local water surplus is the fact that end-of-season storage at New Bullards Bar Reservoir did not change significantly from 1985 to 1990, despite five consecutive years of drought and the transfer of over 800,000 acre-feet of water from the basin. While other reservoirs in the state went dry, management of New Bullard’s Bar resulted in a storage level that never dropped below 500,000 acre-feet.

In a 1992 interview regarding local use of water, the YCWA administrator stated, “We feel we have enough water with our current water rights to do whatever we can envision.”

Noting that an obvious surplus of water for local use exists, and also noting that the YCWA received drought-year revenues in excess of $34 million, it appears that the agency’s proposals for more dams on the South Yuba River are motivated by a desire to store yet more water in excess of ultimate projected local needs so that more income can be generated by selling ever
greater supplies to drought-stricken districts during the next dry period. In 1993, the YCWA administrator stated that water transfers would be considered as a way to pay for new water projects whose principal purpose would be flood control.

This raises a number of vexing questions. Should the YCWA be allowed to dam a river in another county for water transfers? Can water rights be obtained for such a revenue-generating scheme? How will the water-sales income be used? Is the new development affordable given the uncertainties of export sales of water, many of them under temporary and experimental programs of the state? Indeed, can water sales be relied upon in the future?

Neither the existing State Water Plan nor the proposed 1993 update (Bulletin 160) recognizes any reliance on Yuba River flows for water supplies outside the local area. The Yuba River flows are “not a necessary or mandatory part of water supply” for California outside the YCWA territory, according to Department of Water Resources staff working on the plan. Nor does the Water Bank have any sort of future plan that relies on Yuba River water. In a drought scenario, water sales such as those that transpired in 1987-91 could be repeated.

It is interesting to note, however, that in 1991 the state acquired 820,665 acre-feet of water, including 157,200 from the YCWA. In that year, the demand for water was low enough that the state was able to retain 265,000 acre-feet in carryover storage. Thus, in one of the worst drought years ever, the Water Bank would have been able to meet all of its demands without any YCWA water sales to the Bank.

Highlighting the uncertainty surrounding these issues, Water Bank officials in 1993 interviews reflected on how State Water Project irrigation deliveries had been cut to zero, Central Valley Project deliveries had been severely cut as well, and many cities had water-supply shortages in the fifth year of drought. Still, the Water Bank found demand for only about 400,000 acre-feet of water and had overbought in anticipation of greater demands.

The income to the YCWA was an extraordinary anomaly in both the hydrology of the state and the economy of the Agency, and the long-term prospects for continuation are questionable. In 1992, when YCWA supplies were smaller and when the Agency was enmeshed in challenges over the relationship between water
sales and downstream flows for salmon, the Agency decided not to sell any water to the Water Bank. Absence of the Yuba River flows caused “no problem” to Water Bank supplies, according to Department of Water Resources staff.

Throughout the drought, some California crops receiving irrigation supplies from various sources continued to be considered “surplus” crops by the federal government, which paid farmers to curtail production. Thus, while the argument was being made that Water Bank supplies from the Yuba River and elsewhere were essential, irrigation water was still being applied to crops for which the government was also paying farmers to curtail production. Though Water Bank water was intended to go to permanent or high-value crops, it was not specifically restricted from surplus crops, and nobody monitored the actual use of the Water Bank supplies.

The point of these observations is not that YCWA water should not or will not be used for the Water Bank or other export purposes in the future. Indeed, the state may benefit by transferring water now stored by the YCWA but not needed for local irrigation use. What this report does question is a presumed sense of statewide urgency that might be used in attempts to justify yet more dams being built by the YCWA.

It is also worth noting here that the total annual yield of either of the South Yuba dam proposals in the 1976-77 drought would equal only 18.6 percent of the average annual sales of water for export from the Yuba basin in the 1987-91 period.

Further limits to water export are imposed by the lack of ability to move water safely through the Delta to pumping plants that send the water south while maintaining necessary outflows to San Francisco Bay. “Reverse flow criteria” are designed to keep Delta waters from flowing backwards, which causes severe water quality and ecological difficulties. The criteria prohibit the transport of additional supplies southward. This is likely to remain the case unless a facility such as the Peripheral Canal, which was defeated in a statewide referendum in 1982, is built.

Beyond the scope of this report, other concerns have been raised about the YCWA’s sales of water. Most notably, the issue was the subject of lengthy hearings in 1992 regarding water rights complaints, and concerns that the sales jeopardized necessary flows for salmon, steelhead and other public trust resources. The
affected salmon include rare and endangered populations in the lower Yuba and Feather rivers—among few natural reproducing populations of chinook salmon remaining in California. The California Department of Fish and Game argued extensively that the water sales were damaging to downriver fisheries. The YCWA claimed that salmon have not suffered as a result of Agency management. The State Water Resources Control Board has not yet ruled on the issue.

The water sales were also a factor in a controversial bill that was passed to exempt temporary water sales from the scrutiny otherwise provided under the California Environmental Quality Act. According to a June 3, 1990 article in the Sacramento Bee, the law was proposed by the YCWA’s attorney. California natural resources analyst William Kier and others believed that the YCWA transfers would not have been possible without this exemption from the state law.

The water sales were again a factor in a 1992 bill (AB 2899) to stop federally regulated dam operators from selling water when they violate state water quality standards. The bill would have prevented agencies that failed to comply with state regulations from using the state-operated and funded California Aqueduct as a means to transport the water they wished to sell. The bill was opposed by the YCWA, which strived to bypass state regulations by claiming it had a federal permit to operate its dam. This is an unusual case of a local water agency arguing for federal supremacy over states rights in regards to water. The YCWA was successful; the state bill was defeated by one vote. Representatives of areas that had bought Yuba water voted no.

Water Rights

The YCWA has no water rights to the South Yuba. To develop South Yuba dams, the agency would have to secure water rights from the State Water Resources Control Board. Appropriation of water requires a showing of reasonable and beneficial use of the water. The Agency’s administrator in 1993 recognized that “any application for water rights is a protracted procedure these days.”

Prohibitive difficulties with the water-rights issue are
apparent in the EBASCO report. In regard to the Edwards Crossing Dam site, the report stated that “because of existing upstream water rights on the South Yuba River, it is unlikely that a firm water supply could be developed.” No similar statement is made for any of the other South Yuba proposals, though they are all located upstream from the Edwards proposal and below the “existing upstream water rights.” Certainly, whatever limit exists at the Edwards Crossing site would apply to the Humbug and Holbrook sites as well. Thus, the YCWA’s own report states that approval for a firm water supply is “unlikely.” Why EBASCO still considered these projects “buildable” is a good question.

Restricting matters further, the State Water Resources Control Board has declared the South Yuba and all tributaries to the Feather River to be fully appropriated between July 1 and September 30.

Requirements of other agencies must also be met, including a Section 404 water quality permit from the Army Corps of Engineers. This requirement has stymied a number of dam proposals, including the controversial Two Forks Dam in 1989. After investing many millions of dollars in attempts to build that dam on the South Platte River in Colorado, the Denver Water Board—one of the most powerful water agencies in the West—was stopped by the federal requirement.

A clause in the legislation establishing the YCWA prohibits it from taking condemnation action in a neighboring county without that county’s concurrence. Given Nevada County’s inability to use water stored in the YCWA’s proposed South Yuba dams without prohibitively costly pumping to draw the water up to developing acreage, and given strong local support for protecting the South Yuba, agreement within Nevada County to dam this river and forego the values it offers to local citizens appears unlikely. The only scenario that could lead to consideration is one in which the YCWA can pay substantial amounts of money to Nevada County in return for support of the dams. The likelihood of this scenario is about zero, as a discussion of economics later in this chapter will demonstrate.
Projections for Water Use in Yuba County

While the invalidity of claims for flood control and the adequacy of existing water supplies for Yuba County raise the suspicion that water sales are the true motivation for the YCWA’s South Yuba River dam proposals, a look at the YCWA’s own current and projected water use may still be instructive.

Hired by the YCWA, the consulting firm of Bookman-Edmonston Engineering reported in 1990 the following “Present and Projected Water Requests of Districts in Yuba County,” including surface deliveries from the YCWA and groundwater.

Yuba County Water Agency Projections

<table>
<thead>
<tr>
<th>Types of use</th>
<th>Present use (acre-feet)</th>
<th>2020 use (acre-feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>irrigation</td>
<td>418,000</td>
<td>572,000</td>
</tr>
<tr>
<td>urban-civilian</td>
<td>18,700</td>
<td>37,100</td>
</tr>
<tr>
<td>urban-military</td>
<td>3,000</td>
<td>3,000</td>
</tr>
<tr>
<td>waterfowl habitat</td>
<td>25,500</td>
<td>34,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>465,000</strong></td>
<td><strong>646,100</strong></td>
</tr>
</tbody>
</table>

This analysis concluded that future water needs could be met with 77 percent surface water supplies (499,200 acre-feet) and 23 percent ground water supplies (146,900 acre-feet). No explicit mention was made of additional water storage being necessary to meet future demand. Nonetheless, the projections raise some serious questions.

The urban-civilian water use is based on a projected population increase from 57,000 to 110,000 in the YCWA’s area of Yuba County. However, the state Department of Finance—the state agency charged with growth projections—estimated in a special report for the Department of Water Resources that the projected Yuba County population for the year 2020 is 83,100—a countywide figure significantly lower than the 110,000 figure used by the YCWA. Indeed, the difference between the official state projections and Yuba County’s numbers is 26,900—nearly 50 percent of the current population of YCWA’s area. The Water
Agency's estimate represents a 100 percent increase over and above official state projections.

The YCWA's projection has this county—with a 1991 unemployment rate of 14.1 percent (nearly twice the state average)—growing to nearly twice its current size by the year 2020. This raises doubts about the projected needs for urban water.

Even so, irrigation water would still make up 88.5 percent of the water demand in the year 2020, with a projected increased demand of 154,000 acre-feet. This increase, however, may be even less plausible than the projected urban boom.

The state Department of Water Resources estimated in 1991 that Yuba County had a total irrigated crop acreage of 75,100 acres, with 23,900 acres in rice (32 percent), 30,000 acres in tree crops, and 13,000 acres in pasture. The total current applied water use for this acreage was estimated at 358,700 acre-feet (less than the estimate in the Bookman-Edmonston report). With 288,000 acre-feet of surface water delivered by the YCWA, much of the remaining amount came from groundwater.

Considering statewide and nationwide trends toward lower agricultural water usage, the increase in agricultural demand does not appear to be warranted. Both the YCWA's administrator and the Yuba County Agricultural Extension office indicated in interviews in the summer of 1992 that they did not foresee significant increases in irrigated acreage in the county.

**Water Conservation**

Rather than the sharp increase projected by the YCWA, the amount of water used for irrigation may decrease in the future. Better technology, information, and economic incentives are resulting in more conservation of water. The state Department of Water Resources, in studies done for the 1993 California Water Plan (Bulletin 160 Update), estimated that irrigation efficiency in the Yuba County area should increase in the next 30 years. This means that the amount of applied water in acre-feet per acre is expected to decrease; less water will be used to obtain the same amount of production. Water for rice, applied at 6.5 acre-feet per acre in 1990, is expected to decrease to 5.6-5.7 acre-feet. Pasture
water will decrease from 4.2-5.3 acre-feet per acre to 4.0-5.1. Tree crops will decrease from 2.8-3.6 acre-feet to 2.6-3.6. These are the primary crops in Yuba County.

Rice—by far the largest water user on a per-acre and per-crop basis—currently receives over 3 acre-feet of water in excess of that actually needed during the growing season for the crop. Since rice is grown on impermeable soils, much of this water runs off. This has created serious water quality problems in the past. In 1992, the University of California Agricultural Issues Center published a study *Maintaining the Competitive Edge in California's Rice Industry*, and reported that the focus of water-use efficiency should be on reducing such tailwater flows. The study found an average evapotranspiration rate of water from rice fields in the Sacramento Valley to be 3 to 4 acre-feet, while 6.5 acre-feet per acre are being applied to the crop. The report pointed out that water conservation is possible through recirculation, gravity tailwater recapture, and static irrigation.

The Department of Water Resources study for the 1993 Bulletin 160 Update predicted a reduction in rice fields of one acre-foot of applied water per acre. In Yuba County, this could make 24,000 acre-feet of water available for other uses. This savings is nearly enough to provide for the county’s entire domestic water demand, and nearly equal to the total amount available from a major new dam on the South Yuba during the dry years of 1976-77.

Tree crops, representing 40 percent of the irrigated acreage in the county, are especially conducive to drip irrigation techniques that can save great amounts of water while increasing efficiency and production. Numerous other conservation techniques are available, as pointed out in the Department of Water Resources Bulletin, 198-84, Water Conservation in California.

The Bookman-Edmonston estimates did not anticipate new conservation efforts, nor did they assume that irrigated land would be idled as a result of Department of Agriculture price support policies, though those policies are in effect and result in idled rice land.

It may be argued that reductions in applied water to irrigated fields will reduce tailwater flows and groundwater recharge to the larger Central Valley water systems, and therefore be of little value. But questions of water quality and the timing of
flows are important and often ignored considerations in this argument. More important with respect to this report, the existing uncontrolled flows of the South Yuba also benefit the larger water system of the Yuba River, Feather River, and Delta by adding water when it is critically needed in the springtime.

Experience elsewhere in California indicates that various conservation and efficiency improvements could yield greater water supplies at far less cost than the development of new dam sites on the South Yuba, which would be very expensive and yield only small amounts of water in dry years. These are the years when the water would be in high demand.

The Yuba County Water Agency and the farmers it supplies may elect not to pursue any program or effort to reduce their own water demands beyond those efforts required by state law. They certainly do not need to conserve water to continue receiving a dependable and incredibly cheap supply. Failing to pursue water-use efficiency may not attract much attention, even as the water budget of the state tightens. But with the YCWA opposing protection for the South Yuba because the Agency wants to keep its dam options open, the question will surely be raised: Has the agency pursued all responsible means to stretch existing supplies before spending great amounts of money destroying a highly valuable reach of river in another county?

Reservoir Management

Irrespective of water-use efficiency, improvements in supply are available through reservoir management. As indicated in the 1989 EBASCO study for the YCWA, a PG&E contract for hydropower at New Bullards Bar Dam expires in the year 2016, at which point the Water Agency could gain greater flexibility to provide even more water if it is needed. EBASCO found that "remarkable improvement in both the amount of power generated and severity of water shortages would be achieved with a minor modification in operating rules for the New Bullards Bar Reservoir."
The Cost of Water and of New Dams

Additional perspective on the use, export, and search for more water can be gained by considering the costs that are paid for water. The YCWA sells the water to its irrigators for $1.00 per acre-foot. The contracts are restricted to only cost-of-living increases. This is an extremely low cost of water from both a statewide and nationwide perspective.

When water users are paying $1.00 per acre-foot, buying water rights and retiring lower-value farmland such as pasture would likely be far more economical than developing new dam sites, especially ones that have consistently been found to be unfeasible. Certainly no one expects the YCWA to retire any farmlands—the group's expressed interest is the opposite—but the fact that it would be far cheaper to do so than to build dams simply says something about the quality of the dam sites. Costs of the proposed dams are addressed later in this chapter.

The Humbug Dam site on the South Yuba River would, according to the EBASCO study, provide 27,000 acre-feet for the 1976-77 dry years and 83,000 acre-feet for the 1929-35 years. The Holbrook Flat site would provide about the same amount of water. This is not a highly significant amount. By way of comparison, the YCWA sold an average of 145,140 acre-feet per year of surplus water from 1987-91. If the water were sold at the late-1980s rate of $45 per acre-foot, the annual income for 27,000 acre-feet would be only $1.2 million for projects that EBASCO estimated would have respectively cost $224.6 million and $262.2 million in 1989 not counting interest, which would far more than double the cost. If the 27,000 acre-feet were put to use growing rice at the Yuba County rate of 6.5 acre-feet per acre, the entire dry-year yield of one of the dams, costing half a billion dollars or more, would water 4,154 acres—just slightly larger than a single large rice farm in Yuba County. This is a questionable investment at $120,000 per acre for growing rice—a surplus crop that some farmers are paid not to grow.

This scenario admittedly considers only one purpose for the dam—water supply for rice—but since the flood control benefits are nearly non-existent, and since rice growing is the primary use of YCWA water, the figures do raise questions about the relative benefits of the South Yuba dam sites.
Inefficient Dam Sites

Another way to measure the efficiency of the South Yuba dam sites is to compare their heights and capacities to other sites. The Humbug site would be 450 feet high and store 206,000 acre-feet of water. In comparison, Shasta Dam is 487 feet high but impounds 4,452,100 acre-feet—28 times as much storage for almost the same height of dam. Folsom Dam is 340 feet high and impounds 1 million acre-feet. Pine Flat Dam on the Kings River is 429 feet high and holds 1 million acre-feet. Even among recent dam proposals that have not been built, the South Yuba sites are pitifully inefficient. The Dos Rios site on the Middle Fork Eel would have impounded 1.1 million acre-feet. Rogers Crossing, a site soundly defeated on the Kings River, would have held 601,000 acre-feet, but was abandoned in part because its water yield would have been so low—46,500 acre-feet.

Nevada County Considerations

Moving upstream to Nevada County, which is actually in the South Yuba River basin, the Nevada Irrigation District (NID) depends on the Middle Yuba River and Canyon Creek for much of its water supply. The District’s dams store 250,280 acre-feet, and NID has water rights to 270,000 acre-feet in all. A state Department of Water Resources report on Nevada County’s agricultural land use and applied water showed a total irrigated crop acreage of 9,800 acres in 1990, 9,000 acres of which was pasture. The total applied water use for the county was estimated at 41,400 acre-feet, with 39,500 acre-feet irrigating pasture and the bulk of the rest used for tree crops (the NID also serves users in Placer and Yuba counties).

In a report prepared for NID by Harland Bartholomew and Associates titled Public and Private Water Systems and Groundwater for the Nevada County General Plan, May 1992, the authors concluded, “Current water quantities will be adequate to serve projected population increases. However, the expanded demand for treated water for domestic uses may be provided by decreasing agricultural uses from 95 percent of all delivered water to 90 percent, and by instituting water conservation measures.”
In the winter of 1993, the State Water Resources Control Board took action to restore flows in the Sacramento Delta in an effort to protect the endangered runs of salmon that were nearly extinct due in large part to diminished flows resulting from diversions and water consumption throughout the Sacramento basin. Water suppliers were required to give up a portion of their stored water in order to reinstate needed flows. Under new rules, NID may be ordered to release as much as 37,000 acre-feet from its 250,280 acre-feet of storage, causing concern among the District’s staff that some additional storage might be needed after the year 2010.

However, NID operations manager Les Nicholson stated that the most economic source for more water would likely be additional water from the upper South Yuba basin, which could be diverted southward with additional storage in the Deer Creek and Bear River basins, with possibilities of raising Scotts Flat and Rollins reservoirs. This development scenario would have minimal effect on the South Yuba River.

The likelihood of developing a water supply source for Nevada County from the South Yuba below Spaulding Dam is nil, owing, among other things, to the necessity of expensive pumping to bring the water up to a usable elevation. The Humbug Dam site lies at elevation 2,032, while Nevada City, for example, is at 2,600 feet.

Only one remote scenario for Nevada County water supply from the South Yuba below Spaulding was identified by NID staff in a January 1993 interview. That possibility was to supply the San Juan Ridge, a high ridge north of the South Yuba and outside the NID’s territory. However, the Nevada County Planning staff indicated that there is currently no existing or projected need for such a water supply. They reported that development at San Juan Ridge is never likely to justify such a water system. Zoning there calls for lots of 10, 40, and 160 acre minimum sizes—nowhere near the density needed to support an expensive public water system. Zoning requires new homes to have wells or other suitable supplies before construction. The expressed desire of the local community is to keep the area very low density, and county planners foresee no likelihood of zoning changes.

The NID has a water conservation program, and improvements in efficiency will aid in stretching supplies into the
future. Nearly all of the NID irrigation acreage, consuming most of the district’s water, is for pasture—one of the most water-intensive crops. Irrigators are supplied by a steady flow of water in the ditches throughout the irrigation season. Further additions of sprinklers, which often reduce the amount of water applied to the fields by 70 percent, could extend supplies, as could other conservation techniques identified in the state Department of Water Resources publication Water Conservation in California.

Urban water use in the district is increasing rapidly with a growing population, but the new development normally uses no more water on a per-acre basis than the farmland it replaces. In many areas of the state it uses less. In addition, a multitude of water-conservation techniques are just now beginning to be promoted statewide, suggesting that the conversion from farmland to houses will likely save water, sometimes in great amounts.

Enormous potential exists for urban water conservation, and state law requires that counties incorporate water conservation provisions in zoning for multi-family, commercial, and industrial land uses. The Nevada County Planning Department prepared amendments to comply with the state requirement, but instead, the Nevada County Supervisors, in January 1993, decided to declare the county exempt from state water conservation regulations because they considered them unnecessary. If that judgement is correct, then the need for new water supply systems can hardly be regarded as a reason to deny protection to the South Yuba.

While there appears to be virtually no possibility of water development on the South Yuba River for Nevada County supplies, and operations manager Nicholson stated that in his opinion the Parks Bar (Marysville Dam) site on the main stem Yuba is the only suitable site for new storage, NID staff nonetheless expressed reluctance to support any actions that would prohibit other agencies from developing water on the South Yuba. In a 1993 interview, NID Manager Jim Chatigny raised the possibility that a “group of water agencies” may band together to develop new water sources. He said that the NID could consider the possibility of water exchanges. Theoretically, NID’s responsibility for Delta flow releases could be met by another agency, such as the YCWA, in exchange for NID support for damming the South Yuba.
Applying this rationale to the real world—to the South Yuba dam sites as reported on by EBASCO—the entire yield for the dry years 1976-77 at the best proposed dam site would provide only 73 per cent of the water that only the NID is required to release to the Delta under the new regulations, and it is implausible that the YCWA would build the dam entirely for NID’s Delta obligations. It is also unlikely that the State Water Resources Control Board (SWRCB) would grant permission to dam the South Yuba for the purpose of meeting the SWRCB-imposed Delta flows, because in doing so, an important supply of water from the South Yuba to the Delta would be eliminated. This now occurs in the critical months of April, May, and June through the natural runoff of the basin and costs nothing.

The NID officials argued that any amount of water that a new dam might contribute to Delta flows could be helpful if the Decision 1630 requirements become permanent. This view assumes that the YCWA or some group of agencies would build a half-billion-dollar dam solely for a pittance of Delta obligations. This view ignores questions regarding the amount of water available, the cost of its development, the associated tradeoffs, the overall good for Nevada County, and the fact that a multitude of more effective and efficient alternatives are available.

While supporters of the South Yuba argued that the river below Spaulding had no plausible value as a water supply for development or farms in Nevada County, but rather extraordinary value as a recreational magnet for county residents and visitors alike, the NID President in 1986 attempted to argue “local control” as a reason not to protect the river. Opposing state scenic river designation that would safeguard the river as it is, the NID official posed this curious argument: “For the people of Nevada County to relinquish control of this valuable resource at this time is not in the best interests of the present or future citizens of the County. The water will be available for export to other water deficient areas of the state the moment it reaches the Delta. A vital and valuable resource that is now under some degree of control by the county will be lost forever.” He apparently opposed the export of water. Yet, failing to protect the river could allow the YCWA to build dams and leave Nevada County with nothing but a mud-ringed reservoir and dry riverbed.
In 1992, local media carried accounts of joint meetings with the Yuba County Water Agency and Nevada County Supervisors. According to a Marysville newspaper article titled, “Yuba-Nevada Water Relations thawing,” the relationship between the two counties improved as they discussed cooperation on water projects. No details were forthcoming.

Any sort of dealings that could conceivably involve the two counties in a joint effort to dam the South Yuba would be fruitless, as various sections of this chapter have pointed out regarding feasibility, economics, alternatives, and impacts. Walter Yep, Chief of Planning for the Army Corps of Engineers, indicated in an interview in January 1993 that the chances of new dam construction are almost zero, even with new state requirements for added flows of water in the Delta. “It will be extremely tough to build any dams in the future, especially ones that would flood a valley.”

Impacts of South Yuba River Dam Proposals

Having considered the benefit claims advanced by the Yuba County Water Agency for South Yuba dams, and having considered some of the alternatives that are available, it may be worthwhile to consider some of the impacts that would occur if the dams were built.

Land and Resources to be Flooded

The YCWA would have to acquire state park land for either of the projects. About 90 percent of the land in the Humbug Reservoir area is owned by the public as Tahoe National Forest or Bureau of Land Management land. Condemnation of private land would also be required for either the Humbug or Holbrook sites. This would involve many parcels at the Holbrook location. Both dams would flood substantial reaches of free-flowing river. Several rare species, as well as species of special concern, would be affected. Wildlife, fisheries, historic sites, and recreation areas identified in Part 1 of this report would be lost.
The Humbug site would flood about 10 miles of the South Yuba, all found eligible for the National Wild and Scenic Rivers System by the Forest Service, and a portion of Humbug Creek, also found eligible. The South Yuba Trail and lower reaches of the Humbug Creek Trail would be flooded. The Holbrook Flat Dam would flood about 5 miles of the South Yuba and 2 miles of Canyon Creek and, since the dam is proposed in tandem with a 90-foot high dam at the Humbug site, the impacts of the Holbrook project would be even greater than the high dam at Humbug.

Reviewing the river in 1970, the Tahoe National Forest officials stated, "Degradation of the South Yuba River by additional impoundments and diversions would completely destroy the recreational values of the river area which will become more important each year with an increasing populace."

In addition to the dam sites, many miles of roads, construction facilities, and related disturbances would result in even more impacts on the environment and on nearby communities including Nevada City, North San Juan, and Grass Valley.

The Marysville Dam, also identified by EBASCO as potentially "buildable," would flood the Bridgeport area of the South Yuba. This is the locus of activity for the Yuba River State Park Project. Already acquired by the California Department of Parks and Recreation, the site includes more recreation activity than any other site on the South Yuba. The historic Bridgeport covered bridge would be flooded by the water project. Downstream fisheries and wildlife would be severely affected, as documented in the U.S. Fish and Wildlife Service's Appraisal Report, Marysville Alternative, Enlarging Shasta Lake Investigation, 1983.

Beyond the Marysville Project's displacement of more than 500 local people, the reservoir would inundate 70 percent of the total salmon spawning area of the Yuba river—the largest remaining natural salmon and steelhead fishery in the Sacramento basin—with the loss of 29,000 fall-run chinook salmon and 200 winter steelhead, according to 1983 analysis. Forty-seven miles of riparian habitat would be inundated, with major losses of wildlife, birds, and fish, including bald eagle migratory areas. Englebright Dam and two power plants would be flooded. The Pleasant Valley Road bridge at Bridgeport on the South Yuba would have to be relocated, and the historic Bridgeport covered bridge site would be
flooded. The Army Corps in 1990 summed up the Marysville
impacts by stating, “Major environmental effects can be expected.”

**Safety Considerations**

The Holbrook site lies in or directly adjacent to a “high
hazard” landslide zone, according to the *Nevada County Master
Environmental Inventory*. Seismic activity could occur in the
Humbug and Holbrook area, as identified in a *California Geology*
article of August 1978 (see Part 1—Geology).

**Downstream Effects**

While the Humbug and Holbrook dams would directly
flood significant areas, the downstream effects of the projects
would continue for the entire remaining length of the South Yuba.
With diversion of 169,000 and 200,000 acre-feet respectively for
the two projects, the 19 miles of river below Humbug, including all
of the State Park reach, would be severely dewatered. With an
average of 292,960 acre-feet normally flowing in the South Yuba
12 miles below the Humbug site at Jones Bar, the 200,000 acre-
foot diversion would result in a 68 percent reduction in a river
where flows have already been reduced to 66 percent because of
diversions at Spaulding Dam. This would cause extensive effects
on fisheries, wildlife habitat, recreation, and the local economy,
eliminating many of the values documented in Part 1 of this report.
The South Yuba would resemble the North Yuba below New
Bullards Bar Dam—where flows are cut by the YCWA to 5 cfs—
a trickle that disappears beneath rocks in the riverbed.

Water quality impacts on the South Yuba downstream
from the diversion would be severe, owing to temperature
increases, flow reduction, and geomorphic changes resulting from
the low flows and reduction of high water and floods. Detailed
studies documenting these problems would be required of the
project sponsor. These are not available, though ample precedent
elsewhere at hundreds of sites, including the San Joaquin River,
Trinity River, and dozens of other California rivers, indicate that
severe problems can be expected.
Counting both the flooding by reservoirs and the
dewatering by diversion, the Humbug Project would severely
impact 29 miles of the South Yuba, and the Holbrook Project
would do the same to 38 miles. Nearly all of the qualities of
statewide and nationwide significance, identified in Part 1 of this
report, would be lost.

These losses are extraordinary in an era when water
agencies elsewhere in California are improving operations or are
subject to major regulatory reforms to protect and restore instream
flows, riparian habitat, fish, wildlife, and recreation areas. The
YCWA proposals are clearly out of step with virtually every trend
in modern-day water management.

The South Yuba dams would also negatively impact the
salmon and steelhead fisheries of the lower Yuba and Feather
rivers, as well as the regime of flows in the lower Sacramento
River and the Delta. The current high flows of the South Yuba
occur from January to June—including critical months when
salmon need the water for temperature control and spring outflow.
California Department of Fish and Game biologists regard the
existing flow regime of the South Yuba as important in this regard
(see Part 1—Fishery). Fisheries and environmental consultant
William Kier stated that January to June flows are critical to
salmon. “When you have good January to June flows, you have
good salmon returns.” If a YCWA project is built, the winter and
spring flows will instead be diverted to the YCWA’s New Bullards
Bar Reservoir on the North Yuba, where they will be stored for the
agency’s use. While a fish release may also be required from New
Bullards Bar, history shows that these releases are rarely, if ever,
as good for fisheries as the original, natural hydrograph under
which native species evolved. The Bullards Bar release of 5 cfs
for the resident fishery below the dam is a case in point.

Rather than aiding in solving flow problems in the Delta,
进一步填塞和取水，南雅巴河的南雅巴项目很可能会
对南雅巴河和三角洲的末日产生影响，根据鱼类和狩猎生物学家
在1993年访谈中

The issue of salmon, steelhead, lower river flows, and the
Delta are ones in which the YCWA is heavily involved. In 1992,
the California Department of Fish and Game and the State Water
Resources Control Board engaged the YCWA in hearings in an
effort to improve flows from New Bullards Bar Dam for
beleaguered fisheries of the lower river. Because the YCWA is being seriously challenged on the existing level of flow modification, it appears unlikely that the Agency would ever be permitted to cause additional impacts to downstream fisheries by damming, diverting, and storing even more water, especially with no justification of local need.

No Compensation for Losses

EBASCO allotted $3 million for mitigation of environmental damage from the Humbug Dam, and $2 million for the Holbrook Flat project. Estimates were based on a general understanding of the sites; no environmental analysis was undertaken. The estimates are undoubtedly low, as a simple study of the environmental effects would likely cost more than the total mitigation funds allotted.

Because various federal and state laws do not allow development to proceed without “mitigation” for the losses that would occur, the mitigation budget would have to be increased a great deal—if in fact “mitigation” is considered a possibility for this unique section of river.

Feasibility, Costs, and the Likelihood of Success

Because an engineering consultant for the Yuba County Water Agency identified several dam sites as potentially “buildable,” various public agencies and elected officials could conceivably regard those proposals as reasons to indefinitely defer protection of the South Yuba River as a free flowing stream.

Sixty years worth of water project studies by federal, state, and local agencies have failed to find a feasible dam site on this river. Many studies were undertaken, including surveys by the Army Corps of Engineers back when there was no resistance to large dam construction, by the Bureau of Reclamation when it enjoyed unanimous support, and by the state when it proposed dozens of other dams across northern California. The South Yuba
was passed over in an era when proposals were advanced in virtually every conceivable place. Even on the Yuba River, Marysville Dam was studied as the most viable project, but on closer examination, it was deemed unviable. The question here is: Why would the South Yuba now be better than any of those other sites?

Water to Southern California

The South Yuba proposals might be considered the ultimate in a hydrologic guessing game of, “Where does the water go?” Water that has been painstakingly diverted southward from the Middle Yuba to the South Yuba would be diverted back north again to the Middle Yuba and then further north to the North Yuba for storage in the YCWA’s existing reservoir, so that it could be again diverted southward—far southward—for sale outside the local area, most notably in southern California.

In the 100-year-long history of water development in California, one theme has been played out again and again. This is the theme of dry regions in the south attempting to transport water from northern California. Los Angeles succeeded in efforts to export water from the Owens Valley, engendering hostility that continues to this day. Southern California development interests and San Joaquin Valley irrigators successfully tapped northern water with the Central Valley Project, diverting flows of the Trinity River on the north coast, the upper Sacramento, and the tributaries of the Sacramento, and bending them all to the south. Equally successful, in 1959, was the State Water Project, which diverted Feather River flows 600 miles to southern California. Los Angeles then returned to the eastern Sierra and diverted yet more water through the Owens Valley, this time threatening to ruin the biologically vital Mono Lake.

None of this is to say that some diversions were not in order. The water was essential to the growth of the south. But the sense of northern Californians was, enough is enough. Marking the end of such transfers, Californians mobilized in the 1960s to prevent export from dam sites in the Klamath basin (though a 1924 law had already banned dams there). Plans were completed for the damming and diversion of the Middle Fork Eel in 1968, but they
were stopped when that river was included in a state Wild and Scenic Rivers System. In 1982, the Peripheral Canal was defeated in a statewide referendum—even with 60 percent of the voters living in the southern one-fifth of the state—because of its promise of more water export and its feared effects on the rivers of northern California. Even at Mono Lake, conservationists have won repeated court victories requiring Los Angeles to take less water. Northern California has liberally shared its water, but statewide mandates have consistently stressed that northern rivers and water supplies should be guarded from excessive, additional transfers to the south.

In 1993, this theme is being played out in a surprisingly new fashion. The issue is the same—the destruction of a northern California river for export of water to the south—but one player is different. Though located squarely in northern California, the Yuba County Water Agency has acted on behalf of southern California water interests. About 93 percent of the Yuba water that was transferred between 1987 and 1991 was sold to the State Water Project and Water Bank. In 1991, 76 percent of the Water Bank water was marketed to southern California and the southern San Joaquin Valley. In 1981, the North Kern Water Storage District paid for a study of Marysville Dam and its potential to provide water to the southern San Joaquin Valley. More recently, Yuba County officials were approached by the Metropolitan Water District of Southern California and other suppliers regarding short- and long-term water sales, though in 1993 the YCWA administrator said that there was no “active discussion” underway.

Southern California has viable alternatives, including water efficiency exchanges such as those now being carried out with the Imperial Irrigation District. Urban water conservation has been pursued successfully and has vast remaining potential. Water supplies now being used to grow surplus crops on unsuitable soils in the San Joaquin Valley, causing problems of salinization and selenium poisoning at places such as Kesterson, could be sold to southern California.

It may still be argued that southern California needs the water from the Yuba River, and that the YCWA has the right, within legal limits, to do what it wants with the water it stores behind New Bullards Bar Dam. Indeed, this argument has raised few objections except from the state and from fishery advocates in
their efforts to save the endangered salmon populations in the Yuba and Feather rivers. But it is another matter for the YCWA to go to Nevada County and propose new dams that would destroy a free-flowing river of statewide and national significance. This is no different from the threats to the Klamath River, the Middle Fork Eel, and Mono Lake, except that the South Yuba proposal involves only a small fraction of the water supply benefits that those other sites offered.

Proponents of water development on the South Yuba may argue that water sales are not the motivation for the dam proposals, but rather that the purpose is local flood control and local water supply. The previous sections of this report addressed those uses and showed that the South Yuba sites are inefficient on both counts—a conclusion also reached by the Army Corps of Engineers and other agencies.

Beyond these arguments of feasibility, it is abundantly clear that far better flood control and multipurpose options exist. The Army Corps reported that levee raising, Englebright Reservoir reregulation, and New Bullards Bar reregulation had greater feasibility than the South Yuba dams. According to the EBASCO report, significant needs could be met through improved operation of existing reservoirs. Water conservation offers many additional opportunities.

The Cost and the Ability to Pay

If the YCWA were to proceed with a South Yuba dam site rather than investing in more feasible alternatives, the agency would be required to do so without federal funding assistance, as the sites lack Army Corps of Engineers participation. Could Yuba County pay for the dam?

EBASCO’s cost estimates did not include interest. During construction alone, 8 percent interest would double the cost in nine years, to about $500 million. Then interest for the pay-back period of the project would have to be added. The cost estimates are preliminary, at best, and EBASCO staff stated that they were developed primarily for the purpose of comparing the sites to each other.
Projected income from hydropower revenues was not calculated by EBASCO, but the general claim of power productions benefits was based on a speculative PG&E agreement that would affect the entire New Bullards Bar operation, including new income from existing facilities that does not depend on the new dams.

Costs for operations and maintenance were not included in the EBASCO estimate.

One final cost concern: The $2 or $3 million allotted to environmental mitigation literally would not begin to do the job, as an environmental impact statement would cost more than the total mitigation allowance. In 1993, YCWA administrator Donn Wilson recognized, “Economics are what makes those projects tough.”

If economic prospects for South Yuba dams are grim, prospects for the Marysville Project are worse. In 1990, the Army Corps of Engineers estimated that the Parks Bar Reservoir—the principal but not the only part of the Marysville Project—would cost $810 million, for an average annual cost of $75.5 million.

In 1989, when EBASCO found the Marysville Project to be “buildable,” it estimated that the Parks Bar and Dry Creek dams would cost $1,136,300,000 ( $1.1 billion). The Army Corps would not participate, as the project was unfeasible, nor would the Bureau of Reclamation participate, as it concluded the water supply could not be integrated into the Central Valley Project.

While the YCWA received $37 million from the water sales during the 1987-91 drought years, revenue is wisely being spent on levee repairs and water systems. The likelihood of another windfall from export sales is uncertain at best and unlikely except in droughts. In the interests of salmon and Delta water quality, State Water Resources Control Board actions may restrict the Water Agency’s ability to sell as much water in the future.

Looking beyond those particular but questionable water revenues, Yuba County ranks 56th among California counties (third from last) in per capita personal income, and it has one of the highest welfare rates. These unfortunate statistics do not instill confidence in the financial institutions that would have to bankroll the county’s new dams.

If export sales are unreliable, what about local water sales? While Yuba County irrigators pay $1.00 per acre-foot for YCWA water, the cost of water from new projects runs from $200 to $560
per acre-foot, based on Department of Water Resources estimates of wholesale prices from the proposed Auburn Dam—a far better dam site than Marysville, let alone Humbug (if one ignores earthquake hazards near Auburn). Even the Marysville Dam proposal is inactive because of the high unit-cost of water, according to the California Water Plan of 1987.

If water from the South Yuba dams were sold locally, or if anything went wrong with a contract to sell water, local water prices might have to be raised astronomically to cover the debt of the new dam.

In a time when the economics and politics of water are in a state of flux, to say the least, any agency that straps itself with an enormous new debt is likely to be considered fiscally irresponsible.

The most recent California Water Plan recognized that several large water projects in the state have been proposed and studied since the 1960s, but that “these projects [including Marysville] are simply too expensive for agricultural water users under any foreseeable conditions.” Unlike the South Yuba dam proposals, these other sites would enjoy the significant support, sponsorship, and subsidies of federal agencies, but even they are still uneconomic.

The South Yuba dams, costing $224.6 million and $262.2 million without interest, are extremely expensive relative to nearly any dam ever built by a county agency. Recently, the Ramsey-French Meadow Project on the North Fork Stanislaus was rejected by local sponsors in Calaveras County, in large part because of its high costs—$220 million including interest. The Calaveras County agency spent about $600,000 before dropping the proposal in the face of growing complications and stiff opposition. The Auburn Dam site was rejected by Congress in 1992 largely due to high costs and the availability of cheaper, more reliable alternatives. The YCWA’s own Wambo Bar Dam proposal would have cost $160 million—substantially less than the South Yuba sites. In a statement regarding the planned construction of that dam, the YCWA Chairman said in a Sacramento Bee interview on April 2, 1987, “The main reason we’re heading in this direction is that federal government is not building dams anymore.” After the Wambo Project failed because of economic problems, the federal government’s reasons for not building dams anymore may have been more apparent. Unlike the South Yuba dams, Wambo Bar
was essentially a “turn-key” project undertaken by private developers at low risk to the Water Agency, but even this dam stalled out on economic skids.

Perhaps the best indication of whether or not the YCWA can be taken seriously in considering South Yuba dams without federal backing comes from the current work being done on Yuba County levees.

The immediate restoration of levees—not including raising the levees for better protection—costs $33.5 million. YCWA officials went to Washington, D.C. to lobby for the maximum federal support for the project, and they got it, securing agreements that $28.5 million or 85 percent of the cost of the local project will be paid by the federal and state governments. The State Reclamation Board, with its money from the general fund of the state, plans to pay for a portion of the local share of the project even when the state deficit continues at $8 billion per year. The federal government, also in an era of presumed austerity while concern grows over the national debt, will pay 75 percent of the cost, which is the largest federal share allowed under law (a 50 percent share is common). To the YCWA’s credit, it should be added that the agency does not by law have to pay anything for levees. This is more appropriately a county responsibility. But the agency—whose board consists of all five county supervisors and two other elected representatives—decided to spend several million dollars of the $37 million received in water sales revenues for this purpose.

Moving beyond the levee restoration project to the feasibility study of raising the levees, the federal government is paying a 50 percent share and the State Reclamation Board plans to pay for half of the local share, though securing the money from a cash-strapped state may prove to be difficult.

If the immediate flood control needs of the district—being met through a relatively modest expenditure of $33.5 million—are so dependent on state and federal funding, how will this local agency pay for a dam costing $500 million or more and offering negligible benefits? In a 1993 interview, YCWA administrator Donn Wilson stated, “Without federal support, there is no way the Agency has the ability to go ahead with a new dam project. The Agency now has no plans to do any further study of sites on the South Yuba.” Wilson recognized, “As it is, the projects are not
feasible, and the difficulties are great.” But he added, “As a political reality, the Agency will still oppose anything that ties up the possibility for a new dam project.”

**Insurmountable Opposition**

If the YCWA elects to proceed with any of the dam proposals for the South Yuba River, a daunting gamut of financial and regulatory hurdles must be crossed. A sampling of these includes the following.

* Feasibility study.
* Bond approval and sales.
* National Environmental Policy Act requirements for an environmental impact statement.
* State Water Resources Control Board water rights for the project and for its uses of the water.
* Preliminary permits and construction licenses from the Federal Energy Regulatory Commission.
* Section 401 water quality permits from the state, through the Regional Water Quality Control Board.
* Section 404 Water Quality permit from the Army Corps of Engineers and Environmental Protection Agency.
* U.S. Fish and Wildlife Service and California Department of Fish and Game reviews with mandatory conditions on various permits.
* Endangered Species Act restrictions, especially regarding downstream salmon.
* Concurrence with Nevada County, because the Yuba County Water Agency would be acting beyond its jurisdiction (State Water Code Appendix 84-3.4).
* State and local approvals for related road and highway projects.
* Acquisition of State Park land.
* Acquisition of Bureau of Land Management land.
* Acquisition and special use permits for taking Tahoe National Forest land.
* Condemnation of private property.
With all the practical large dam sites being already developed in California, water resource observers—including historians, scientists, engineers, many politicians, and many water development agency personnel—believe that no major new dam sites will be developed in California in the foreseeable future.

Why Persist in Supporting Dams That Will Never Be Built?

It appears that the essential facts surrounding South Yuba dam sites have little to do with the flood control and water supply visions expressed by dam supporters. Rather, the advocates of South Yuba dams are responding with a principle that nothing should ever be done to inhibit the development of water, even if there is no practical or conceivable conflict. This view holds that any dam proposal is more valuable than a free-flowing river, and no dam site should be off limits to development. The Army Corps, Bureau of Reclamation, and state Department of Water Resources have abandoned this view, but some local water agencies have not.

If proposals for dams proceed, then one could look to other recent proposals to gain a sense of the outcome. Only one large project (on the North Fork Stanislaus) has been developed in California since New Melones Dam on the main stem Stanislaus was completed in 1979. Since then, major proposals were stopped on the Tuolumne, Merced, South Fork Merced, Kings, Kern, South Fork American, American, and at other sites. Going further back, no major new projects have been successfully conceived since the early 1960s. And that pattern has been repeated nationwide. One of the few projects to be started in the 1980s, the Army Corps spent $85 million on Elk Creek Dam in Oregon, only to be stopped in mid-construction. The Governor of that state now calls for the partially completed dam to be torn down. A significant point here is that all of these other sites were far more feasible and economic than even the most optimistic possibilities on the South Yuba.

The only product of continuing consideration of South Yuba dams would be the waste of money and of people’s attention, both of which are urgently needed for purposes other than fruitless
study, pursuit, and litigation of dam proposals held over from a bygone era of water development expectations.

This report proposes, instead, that the qualities of this river be recognized, and that both Yuba and Nevada counties, along with the state and federal governments, capitalize on those qualities by protecting the river, at very little cost, for use and enjoyment the way it is.

Small Hydroelectric Proposals

On a wild, undeveloped section of the South Yuba between Purdon crossing and the Highway 49 bridge, two small hydroelectric projects were proposed in the 1980s. Both sought to take advantage of the Public Utility Regulatory Policies Act of 1978, which offered economic incentives to hydroelectric developers. Both projects received preliminary permits from the Federal Energy Regulatory Commission (FERC) for planning purposes. Then, both received licenses for construction. Both attracted significant opposition from local and statewide interests and were subsequently dropped.

Miner’s Tunnel Project

Located half a mile upstream from the Highway 49 bridge, an 800-foot-long tunnel, dug in the 1880s by gold miners, diverts high flows of the South Yuba through the mountain in order to short-cut a bend in the river. At this site, the Northwest Power Company of San Francisco proposed a $3-$4 million hydroelectric facility that would divert water from a 70-foot-long dam backing up a 400-foot-long forebay. Water would then flow through the existing Miner’s Tunnel, followed by a 60-foot-long steel penstock to a powerhouse. For a half-mile reach, minimum flows of 40 cfs, reduced to 20 cfs during dry years, would be released to the river. A diversion of 160-800 cfs would go to the powerplant.

The diversion dam and forebay would be located on Bureau of Land Management property. The penstock, powerhouse, and some access roads would be located on state park land. One and a half miles of power lines would be constructed
into the canyon. Northwest Power planned to develop the forebay impoundment for swimming, with wheelchair access. Parking and camping facilities would be built at the top of the canyon. The project would have a maximum capacity of 2.5 megawatts on a run-of-the-river basis, involving no storage of water, with an estimated 9 million kilowatt hours of energy production per year.

The Miner's Tunnel project would provide water only during high flows, December through June. It would produce nothing during the summer months. Thus, the project would not provide a dependable year-round supply and would not supply peaking power.

The Northwest Power Company applied for its preliminary permit from the FERC in 1982, and initiated planning work. In 1983, the company filed for a construction license. The Department of Parks and Recreation argued that under section 5001.65 of the California Public Resources Code, "commercial exploitation of resources in units of the state parks system is prohibited." Because the state was unwilling to sell the needed land, the developer was in the awkward position of having to condemn state park property, which was allowed under the Federal Power Act administered by FERC (the practice of condemning state park property was later restricted in the National Energy Policy Act of 1992). Opponents to Miner's Tunnel argued that allowing the project would be a dangerous precedent to park lands throughout California.

The project was the primary stimulus for the formation of the South Yuba River Citizens League (SYRCL), which objected with a petition of 1,450 signatures. The group charged that the dam, diversion, and development would be an eyesore and would degrade the recreational values of that section of river—one of the most popular for swimming, hiking, and picnicking. Transmission lines, roads, the penstock, and the dam would scar the canyon walls and floor.

The Northwest Power Company claimed that recreation would be unaffected because the project would not operate from June to December. Yet a large share of the river recreation occurs in the spring when flows in the river would be reduced. FERC licensed the project in 1985.

The Nevada County Board of Supervisors opposed development in the canyon after a massive outpouring of public opinion in the late 1980s favoring protection of the South Yuba.
Facing appeals by SYRCL and other delays, Northwest Power Company subsequently lost its contract for power sales to the Pacific Gas and Electric Company, failed to find alternate purchasers for the power, and decided in 1991 not to pursue the project. Had the economics of the power sales not faltered, there is little reason to think that the project would have been stopped.

**Excelsior Project**

With many similarities to the Miner’s Tunnel project, Excelsior would include a 16-foot-high dam stretching 120 feet across the river at a site where an old dam had been breached, 1.5 miles above the Highway 49 bridge. Water would be diverted for 3,700 feet through a 15-foot-diameter tunnel in the mountain on the south side of the river. An 800-foot-long penstock, a power plant, and a 2.9 mile long transmission line would be constructed, along with a road down a tributary canyon to the river. Accommodating 1,200 cfs, the plant would have a capacity of 14 megawatts, for average annual production of 25,000 megawatt hours of electricity.

Dewatering would affect about a mile of river and, like Miner’s Tunnel, would eliminate a 4-mile-long Class IV and V kayak run extending from Purdon crossing to the Highway 49 bridge. The project would not operate in the summer.

Facilities would be sited on public land administered by the Bureau of Land Management and planned for transfer to the state for the South Yuba River State Park. Private land was also required where the landowner opposed the development. A minimum release of 40 cfs to the river would have been required, reduced to 20 cfs in dry years.

The Department of Parks and Recreation stated that the diminished flows would reduce flushing action and increase water temperatures, which could lead to algal blooms and decreased water quality that “would diminish the recreation value of the downstream State Park system lands.”

The South Yuba River Citizens League intervened before FERC and charged that the development would harm the river by dewatering it and would scar the canyon with power lines, the
dam, the penstock, and the powerhouse. In 1988, FERC licensed
the project for construction.

Nevada County joined in opposition, calling for
termination of the license in March 1992, objecting to the manner
in which the developer’s plan addressed erosion control,
recreation, historic sites, and visual blight. The county called the
proposal “an irreverent and flagrant industrialization of almost a
mile of the revered South Yuba River.”

Hearings were held and extensions of the license were
granted to the Northwest Power Company, but in December 1992,
the Company dropped the project and filed a request to surrender
the license.

Hydroelectric Power and Its Use

The amount of power to be produced by the Miner’s
Tunnel and Excelsior projects was scarcely measurable from a
statewide perspective. Miner’s Tunnel, for example, would have
produced only 0.0008 percent of the energy of California’s oil and

More importantly, neither project would have produced
any power in the peak season of summer. This made the power
purchases undesirable to PG&E, which nevertheless was required
to buy the electricity under the Public Utility Regulatory Policies
Act. Furthermore, this act required the utility to pay “avoided
cost”—the cost that utilities would have incurred if they had
constructed new facilities themselves. The price of the
replacement energy decreased in the decade following 1982,
requiring PG&E to pay less under the “avoided cost” provision.
This was one important reason that the Miner’s Tunnel and
Excelsior projects became economically unfeasible.

The energy goals of California, as expressed in the 1990
Electricity Report and the 1992-93 California Energy Plan from
the California Energy Commission, center on energy efficiency
and demand-side management. The energy plan stated that
“improving the efficiency with which energy is used in all sectors
of the economy... has now become California’s most promising
option for assuring the energy service needed for a growing
population.” Energy conservation programs and efficiency
standards for new buildings and appliances have caused a 15 percent decrease in per capita energy consumption since 1978. As energy efficiency and conservation become increasingly important in California’s energy planning, the addition of new sources of power receives closer scrutiny.

A major factor in this attention toward new sources is a facility’s capability to help meet the state’s peak demand, which is growing faster than total electricity use. Since peak demand occurs during the summer with the use of air conditioning, run-of-river hydroelectric projects that operate only in winter and spring contribute nothing to meet the peaking needs.

Regarding the future of small hydroelectric development, the Electricity Report does not predict growth. “The long range outlook shows no growth in qualifying facility development . . . . Under these conditions, financing costs and investor hurdle rates are too high to result in any significant development.”

As part of the 1990 Electricity Report, the Energy Commission made an assessment of need for new resources. The Commission found PG&E to have limited needs for new generation for the rest of this decade because of “current abundant resources and intent to pursue aggressive demand-side management programs.” Among renewable energy resources, the Commission found that solar, wind, geothermal, and biomass were the most viable options for future development. The report did not include hydropower because “there are already so many competing demands on California’s water resources that we have not analyzed any potential for additional [hydro] electricity generation.”

In preparation for the Energy Commission’s Electricity Report, PG&E analyzed needs to the year 2011. Hydropower was not included among reasonable new resources. The prevalence of hydropower in PG&E’s resource mix already makes the utility vulnerable to dramatic swings in supply, depending on the wetness of the year.

While the amount and timing of the power to be produced by the proposed South Yuba projects are not desirable to utilities or to the statewide power grid, a radical surge in energy prices could reverse this situation, and once FERC accepts the surrender of the licenses for both the Miner’s Tunnel and Excelsior projects, another applicant could file for a new FERC permit at any time.
Wild and Scenic designation offers an opportunity to preserve our national wild river heritage for future generations.
Part 3 National Wild and Scenic River Designation

The National Wild and Scenic Rivers System

Inclusion of part of the South Yuba in the National Wild and Scenic Rivers System would provide the best protection for the South Yuba River and the only secure protection from federally licensed dams.

The Wild and Scenic Rivers System, sometimes referred to as simply the National Rivers System, was enacted by Congress as a means to protect outstanding rivers from dams and water developments, to encourage the protection of riverfronts, and to more effectively manage recreation along the waterways. Land use on private property is not regulated by the federal government, but remains as is, under the jurisdiction of local and county governments. The use of condemnation to buy land is prohibited along the South Yuba because over 50 percent of the river corridor is already in public ownership. Even on other rivers in the National Rivers System where condemnation is permitted, it has almost never been used (see Part 3-Effects of Designation).

The Wild and Scenic Rivers Act, Public Law 90-542, was passed in 1968 and states, "It is hereby declared to be the policy of the United States that certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations. The Congress declares that the established
national policy of dam and other construction at appropriate sections of the rivers of the United States needs to be complemented by a policy that would preserve other selected rivers or sections thereof in their free-flowing condition to protect the water quality of such rivers and to fulfill other vital national conservation purposes."

The motivation for the Act came out of controversies in the early 1960s over the damming of free-flowing rivers. With no long-term means of protecting their streams, people along rivers all over the country were constantly losing struggles to protect their valleys and property from water projects. The Wild and Scenic Rivers System was viewed as an alternative to damming that would "balance" water development with river conservation.

With 60,000 large dams on nearly every major river outside Alaska, with 200,000 miles of channelization, and with hundreds of thousands of miles of polluted rivers and heavily developed shorelines, the goal of "balance" is unmet by any standards. In California, 38 rivers and forks of rivers totaling 1,901 out of 26,970 river miles—a figure that does not include many small streams—are designated. Thus, the protected stream mileage in California is only 7 percent of the total, and perhaps half of that if the total river mileage figure included small streams.

Rivers are included in the system by an act of Congress. This may or may not be preceded with a "study" undertaken by the involved federal agencies. In the South Yuba's case, these agencies are the Forest Service and Bureau of Land Management (BLM), which together with the California Department of Parks and Recreation manage over half of the land along the river.

Both federal agencies completed a preliminary study in 1970 and recommended that Congress consider the South Yuba for wild and scenic status. In 1991 and 1992, both agencies again completed "eligibility" studies. The agencies plan to combine their efforts in 1993 and to prepare a "suitability" analysis, which will be helpful but not necessary for congressional action.

**Effects of Designation**

The stated intent of the National Rivers System is to maintain the status quo along the rivers—to protect the river
resources and the corridor as they exist. This includes protection for landowners and residents from projects such as dams that would change the environment or displace landowners. People, homesites, farms, or businesses would not be displaced under the Wild and Scenic River proposal.

Dams

The primary effect of including the South Yuba in the National Wild and Scenic Rivers System would be a prohibition on new dams. The Excelsior and Miner's Tunnel projects would be stopped permanently, as would the Humbug and Holbrook Flat dams. Designation to the lowest reach of the river would require that a Marysville Dam proposal not flood the South Yuba above the current pool of Englebright Reservoir. This would not interfere with several lower options at the Marysville site, but would conflict with the upper 30 feet of the largest Marysville Reservoir proposal. That proposal is inactive and due for deauthorization.

Recreation Management

With designation, the public agencies along the river would give a higher priority to recreation management than they do now. While details would be resolved in a management plan prepared by the agencies, National River status would likely mean additional maintenance of public land areas, attention to problems of vandalism and trespassing on private lands, and possibly additional hiking trails and limited development such as parking improvements on public lands.

Land Acquisition

It is possible that public agencies could acquire land from willing sellers for open space protection. Condemnation of land, however, would be banned because the Wild and Scenic Rivers Act prohibits condemnation in fee simple when more than 50 percent of the river corridor (a strip averaging one-quarter mile
back from each shore or one-half mile wide in total) is already in public ownership. At least 54 percent of the South Yuba corridor is already in public ownership. Even without this requirement, the federal and state agencies’ policy, as expressed by Tahoe National Forest, Bureau of Land Management, and California Department of Parks and Recreation officials, is to have no condemnation of any kind.

Easements to property, which involve only partial rights to the land, are occasionally bought by public agencies as a way of preserving open space while still allowing people to retain ownership and to stay on their land with their homes, farms, or businesses intact. Typically, the easement consists of a requirement to retain open space along the riverfront. Landowners are fully compensated for the easement’s restrictions against subdividing open space for new development. The Wild and Scenic Rivers Act prohibits the use of condemnation even for easements in cases where local government has adopted effective land-use regulations for protecting the riverfront corridor. Nevada County has, in fact, adopted strong regulations that already accomplish this goal (see Part 1—Land Use). The federal agencies recognize counties among other forms of local government, which means that the use of condemnation, even for easements, would not be allowed, provided that the county regulations are adequate to protect the river. In any event, it is not the intent of any agency to use condemnation of any kind. No land has ever been condemned under the wild and scenic program in California, where rivers have been designated ever since the inception of the Wild and Scenic Rivers System.

Wild and Scenic River designation actually gives landowners more, not less, protection from condemnation, because the Forest Service already has the legal right to use eminent domain within the Forest proclamation boundary, which already includes all land in the South Yuba corridor above Humbug Creek. Though it is extremely unlikely that condemnation would ever be used anyway, this legal authority would be stopped by Wild and Scenic designation. Far more important, the designation prohibits condemnation by private individuals or public agencies for water projects, which has been an imminent threat recently, and could arise again if the river is not designated.
Land Use Regulation

Under the Wild and Scenic Rivers System, there is no zoning or regulation of private land by the federal government. Land use regulation is by local and county governments only. Nevada County already has a zoning ordinance in effect, and this would continue.

Private Timber Lands

With or without wild and scenic designation, timber harvesters operating on private land must comply with the California Forest Practices Rules. If the South Yuba were designated as a National Wild and Scenic River, these rules would still apply (see Land Use—Logging). Logging would be permitted. However, areas within 200 feet of the high water line would become “special treatment areas” where the state would require that special consideration be given to silvicultural and timber operations. The required timber harvest plan would have to address Wild and Scenic River values. Precise requirements in this regard are not stated in the rules (Rules 933.4, 953.4).

Mining

Existing mining would continue, and new mining claims could be allowed except in reaches classified as wild (see Part 3—Management). Motorized equipment could continue to be used.

Water Supply Systems Along the River

Small water supply projects, existing water systems, and developments on tributaries and outside the one-half mile wide corridor are unaffected by wild and scenic designation. The water supply system for the town of Washington, located on Canyon Creek, would be unaffected.
Recreational Use

Ample evidence elsewhere indicates that recreational use increases on desirable rivers with or without national designation, and the rate of increase may be unrelated to the National River status. Without designation, however, the recreational qualities of the rivers are sometimes lost—for example, if a dam is built—and with them go not only recreation opportunities but also associated economic values.

Land Values

Land values within and adjacent to the river corridor often increase with national river designation, owing to the protected quality of the surrounding landscape. The South Fork New River in North Carolina, the Rogue in Oregon, and the Delaware in Pennsylvania are examples where the increases in property values have been documented. Along the Delaware, where property values nearly doubled while nearby lands remained the same, realtors use the National Wild and Scenic River status as a selling point when marketing property.

Federal Lands

On federally owned land within the corridor of a National Wild and Scenic River, management of resources is undertaken to protect the values of the river while allowing other activities as much as possible (see Part 3-Management).

Eligibility for Designation as a National River

To be eligible for National Wild and Scenic River status, a river must be free flowing and possess one or more “outstandingly remarkable” value for scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar qualities. Both the
Forest Service and BLM have determined that the South Yuba is eligible for designation.

**Free Flowing**

With the exception of Spaulding Dam, Van Norden Dam, and the lowermost half-mile of the river in the backwaters of Englebright Dam, the South Yuba is free flowing.

The 40-mile-long reach between Spaulding Dam and Englebright Reservoir has no dams or diversions. While reduced flows below Spaulding do affect the river, many important values remain.

The type of intrusions found on the South Yuba are common on many rivers included in the National Wild and Scenic Rivers System. Dozens of the national rivers have dams or diversions upstream and downstream from the designated reaches, including such high-ranking members of the system as the Rogue, Deschutes, and Owyhee in Oregon, the Skagit in Washington, the Snake in Idaho, the Missouri in Montana and South Dakota, the Rio Chama and Rio Grande in New Mexico, the Niobrara in Nebraska, the Saint Croix and Namekagon in Wisconsin, the Little Beaver in Ohio, the Allegheny and Delaware in Pennsylvania, and the Allagash in Maine. In California alone, dams and diversions lie upstream of the nationally designated Klamath, Trinity, Eel, South Fork Eel, American, Tuolumne, and Merced. Diversions elsewhere in the National Rivers System have been more severe than they are on the South Yuba. The Bureau of Reclamation diverted nearly 90 percent of the Trinity River at the time of its designation.

Any claim that existing water development makes the South Yuba ineligible for National Wild and Scenic River designation clearly ignores the history of the National Rivers System, with its recognition of “balance” and its ample precedent for including quality rivers below dammed and diverted sections.

Existing remains of dams and ditches and the presence of mining activity, logging, and land development (including the town of Washington) in no way disqualify the South Yuba. The Wild and Scenic Rivers Act and guidelines for its implementation
are clear that all of these activities may coexist with a Wild and Scenic River.

**Federal Agency Findings**

In 1970, the *South Yuba River Multiple Use Survey Report*, prepared by the Tahoe National Forest, found the river eligible for Wild and Scenic River designation and recommended that "the South Yuba River be included in the Regional priority list as a ‘Scenic and Recreational’ river for submission to the Chief and Congress as a potential addition to Section 5 of the Wild and Scenic River Act." The document also recommended that "the Forest Service consider the potential inclusion of the South Yuba River as a scenic and recreation river in all future development and plans."

In April 1970, in *Feasibility of Including the South Fork of the Yuba River under the Wild and Scenic River Act, Preliminary Report*, BLM studied the reach from the Forest Service boundary to the mouth and recommended that this section of the South Yuba "be submitted for consideration for classification as a scenic river under the Wild and Scenic River Act." The agency also recommended that "BLM consider the potential inclusion of this stretch of the South Fork of the Yuba River as a scenic river in all future construction and development plans." Both of these 1970 reports go beyond the question of eligibility. They appear to find the river suitable for designation and to recommend such action.

In 1991, the Forest Service again found the river eligible from Spaulding Dam to just above Humbug Creek where Forest Service ownership ends (the agency did not consider eligibility below that point). Also eligible was the entire length of Lower Castle Creek to the South Yuba River, and the South Yuba from 1 mile above the Lower Castle confluence down to Spaulding Reservoir. Humbug and Fordyce Creeks were likewise found eligible. The Forest Service reported that these reaches possessed "outstandingly remarkable” values for recreation, scenery, and history.

In 1992, BLM studied the river from the Forest Service boundary above Humbug Creek to Englebright Reservoir, with cooperation from the California Department of Parks and
Recreation. The agency found the South Yuba eligible, citing values for recreation, history, wildlife, and scenery. Wildlife values included the presence of the endangered bald eagle in winter, the spotted owl, and other species. BLM regarded the California spotted owl as an outstandingly remarkable value. The owls are also found within the Forest Service reach.

Eligibility Conclusions

The South Yuba River Citizens League has found the river eligible for designation from Van Norden Dam to Spaulding Reservoir, and from Spaulding Dam to Englebright Reservoir, with Lower Castle Creek, Humbug Creek, and Fordyce Creek also being eligible (not all of these reaches are recommended for designation—see recommendations later in this chapter).

Outstandingly remarkable values include recreation, history, and scenery, as found by the Forest Service and BLM and as documented in Part 1 of this report. The Citizens League also found outstandingly remarkable values for wildlife, geology, and other features.

In terms of wildlife, endangered bald eagles and California spotted owls forage in the river corridor. The relatively undisturbed canyon also holds critical deer habitat with winter range and a migration crossing, and a wide variety of additional habitat for other species, including several species of special concern. Though South Yuba habitat for spotted owls and other species is not unique in the Tahoe National Forest, these species and their habitats are nonetheless remarkable from a national perspective.

In terms of geology, the gold deposits of the Yuba basin were unique in California and the nation. The gold has been mined out, but the geologic features remain. While geologic values have traditionally been recognized as spectacular rock outcrops or similar features, this report does not overlook the fact that the South Yuba’s geology is perhaps one of the more significant features anywhere in the United States in terms of the economic, social, and environmental history that stem from geology along a river.
Regarding wildlife, plantlife, recreation, and the geography of California’s rivers, the South Yuba possesses an additional outstanding value. It remains free flowing for 40 miles through middle and lower elevations of the Sierra (see Part 1—Statewide Significance). Only one other river in the Sierra Nevada is entirely free flowing within this broad window of gradient at lower elevations.

Only one outstandingly remarkable value is needed for a river to be eligible for National Wild and Scenic River designation.

Suitability for Designation as a National River

The South Yuba is clearly eligible for Wild and Scenic River designation, but the question remains: would protection of the river be in the best public interest? This is the question referred to in wild and scenic deliberations as “suitability.” The following narrative probes the various aspects of this question.

Need for Protection

Since 1983, local citizens, the state of California, and Nevada County have been engaged in efforts to protect the South Yuba from private hydroelectric proposals. Two projects—Miner’s Tunnel and Excelsior—were licensed by the Federal Energy Regulatory Commission. Only National River designation will securely protect the South Yuba from recurrent proposals of this type.

Likewise, water projects identified by the Yuba County Water Agency would have severe negative effects on the South Yuba and its canyon. The threat of such action will always exist without Wild and Scenic River designation.
Status of Ownership

Over half the South Yuba corridor is owned by public agencies. This provides an exceptionally good base for river protection and public recreational use.

Existing and Potential Development

With designation, PG&E and the Nevada Irrigation District would continue to use facilities and water of the South Yuba basin as they do now.

Homesites and some commercial development exist along the river from Kingvale to near Spaulding Reservoir. The homes are rustic in nature and blend in well with the landscape. This development does not conflict with designation, though the South Yuba River Citizens League does not recommend this reach for National River status.

From Spaulding Dam to Englebright Reservoir, very little development is found, and it poses no conflicts to the designation. The town of Washington sits along the river and does not conflict with the designation. Rather it adds an attractive and interesting community with historic, recreational, and scenic value.

While some new land development may occur within the corridor, this would not be in conflict with river protection goals because zoning and land development regulations in Nevada County apply. No reaches of the corridor hold potential for large-scale or high-density development that might otherwise conflict with river protection.

The county has zoned all of the corridor for various degrees of open space or low-density development. The county zoning is adequate to protect river values (see Part 1-Land Ownership-Private).

Timber

The BLM reported that very little commercially marketable timber exists in the South Yuba corridor below Humbug Creek. The agency foresees no timber sales on BLM land
in the corridor. Nor would the California Department of Parks and Recreation sell timber after these lands are transferred to the state.

On National Forest land above Humbug Creek, some tracts of marketable timber do exist. This is mostly limited to north-facing slopes on the south side of the river, and only below Fall Creek. Entirely separate from National River designation, restrictions of many kinds affect commercial grade timber in the limited areas where it does occur.

— No logging is permitted within 200 feet of the river, and setbacks are sometimes even greater.

— Visual quality objectives call for "partial retention" of a natural appearance.

— Recreation opportunity classes are "semi-primitive motorized" for two-thirds of the National Forest portion of the corridor, and "roaded natural" for one-third. Both restrict the amount of logging.

— Restrictions limit cutting on unstable soils and steep slopes, which account for much of the corridor.

— Evolving policies favoring continuous forest cover, wildlife and riparian corridors, and old growth protection are likely to limit harvesting further.

While data in board feet are not available from the Forest Service, the restrictions mean that large amounts of timber will not be harvested, regardless of Wild and Scenic designation and classification.

Designation in the "scenic" classification (see Part 3-Classification), in combination with other harvest restrictions, would result in a "marginal yield" of about 5 percent of the timber inventory being cut per decade, according to Tahoe National Forest officials. "Wild" classification would mean that no logging would be done within the canyon corridor. This would be similar to management of the North Yuba River corridor, where logging is curtailed because of the scenic highway corridor.

In its 1970 Multiple Use Survey Report, the Forest Service reported on the reach above Washington: "There is little commercial timber land within this river section and timber harvesting is not anticipated in the near future." For the reach below Washington, the report stated, "On the land adjacent to the river, it has not been economical to harvest the scattered stands of timber on the steep slopes."
Commercial timber on private land in the corridor exists on several tracts above Edwards crossing. Timber cutting on these lands is regulated by the State Forest Practices Act, which provides for the protection of river values, including setbacks of 200 feet from state or national wild and scenic rivers. Even within these setbacks, however, logging can occur (see Part 3—Effects of Designation). As a precedent, logging along the rivers of the north coast of California has been administered by the state since their designation in the National Rivers System in 1981.

Mining

Both recreational mining and mining on registered claims are regulated by state and federal agencies. No further regulation is necessary with Wild and Scenic designation.

Grazing

Though a small grazing allotment does exist on a Forest Service tract above Spaulding, very little actually occurs. BLM lands have no grazing allotments within the corridor. No potential for additional grazing exists, due to lack of suitable grazing land.

Proposed Water Projects

Proposed dam sites have been a concern to some decision makers. Both Forest Service and BLM officials have stated that water projects are probably the only concerns that could pose serious questions about the South Yuba’s suitability. Given the perceived importance of this topic, Part 2 of this report is devoted entirely to proposed water projects. Part 1—Summary also addresses the dams.

The two proposed hydroelectric dams, Miner’s Tunnel and Excelsior, have been abandoned, and FERC is expected to terminate the licenses.

Humbug and Holbrook Flat dam sites were called potentially “buildable” by EBASCO, an engineering firm hired by
the Yuba County Water Agency. With the EBASCO report available for reference, the Army Corps of Engineers studied the Yuba basin in 1990 but found no projects worthy of further consideration.

In summary, the proposed dams on the South Yuba do not present a suitability conflict with Wild and Scenic River designation because the dams are unfeasible, uneconomic, and unjustified. They are not viable solutions to any water resource problems. Far better alternatives are much more readily available. Effects of the South Yuba dam proposals would be severe and cannot be mitigated, as the resources cannot be replaced elsewhere.

Likewise, the Marysville Dam project, which would flood about 1 mile of the lowest reach of the South Yuba, is unfeasible and was due to be automatically deauthorized in 1992. No local sponsor or state support for the project exists, and the Army Corps found this $1.1 billion project to be in conflict with the Endangered Species Act and unworthy of further consideration.

Public Opinion

The South Yuba River Citizens League has had widespread support for protection of the river. Hundreds of people have attended county supervisor meetings when the fate of the river was being discussed. Support for Wild and Scenic designation has come from a wide range of local, civic, and statewide interests, as well as national groups such as American Rivers and the River Network. As this report goes to press, the League is gathering an impressive list of endorsing organizations, businesses, and property owners.

The superintendent of the Gold Mines District of the California Department of Parks and Recreation stated “full support for National Wild and Scenic River designation of the South Yuba.” The Director of the Department, under the administration of Governor Pete Wilson, likewise supported national designation in February 10, 1993 letters to the Forest Service and BLM, stating, “Prompt action by the U.S. Forest Service and Bureau of Land Management to secure Wild and Scenic designation would
be a major step to protect the historic, aquatic, and recreational resources of this river.” In July 1989, the Nevada County Board of Supervisors unanimously voted to support state park status, which precludes both the Humbug and Holbrook Flat dam projects because state park lands would have to be taken by developers.

Costs of Protection

Very little expense would be involved in protecting the South Yuba; the primary action would be leaving the river as it is. Wild and Scenic River designation would mean few additional expenditures, as the California Department of Parks and Recreation is already planning on administering a 21 mile corridor as a state park. The Forest Service is already managing its section of the corridor for riparian, wildlife, and recreational values, and is planning a trail extension from Humbug Creek to Washington. No costs for designation would be incurred by county government or by any local municipalities.

Additional improvements, however, could be made through public acquisition of key parcels from willing sellers only. The Forest Service could also trade suitable lands elsewhere for South Yuba canyon parcels held by forest industry landowners. Other possible improvements could be minor upgrades in parking and erosion control at several sites, and additional trail development.

Protecting the river will provide great economic benefits to the area, as described in Part 1—The River’s Value to the Local Economy.

Classification

Under the Wild and Scenic Rivers Act, designated rivers are classified as wild, scenic, or recreational according to the following guidelines.

Wild river areas: free of impoundments and generally inaccessible except by trail, with watersheds and shorelines essentially primitive and water unpolluted.

Scenic river areas: free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.
Recreational river areas: readily accessible by road or railroad; rivers may have some development along their shorelines and may have undergone some impoundment or diversion in the past.

Federal Agency Classification Findings

The Tahoe National Forest has identified the following potential classifications based on existing conditions.
— 1 mile above Lower Castle Creek to 1 mile below the creek: scenic.
— 1 mile below Lower Castle Creek to Spaulding Reservoir: recreational.
— Spaulding Dam to Lang crossing: recreational.
— Lang crossing to dirt road 1/2 mile below Fall Creek: wild.
— 1/2 mile below Fall Creek to 1 mile below Washington: recreational.
— 1 mile below Washington to 1.5 miles above Humbug Creek: scenic.
— Lower Castle Creek, entire: scenic.
— Fordyce Creek, Fordyce Dam to Spaulding Reservoir: scenic.
— Humbug Creek, source to North Bloomfield: recreational.
— Humbug Creek, North Bloomfield to 1/2 mile above South Yuba River: scenic.

BLM has not yet proposed a classification recommendation for the South Yuba from the Humbug Creek area to the mouth of the river.

South Yuba River Citizens League Findings

The South Yuba River Citizens League recommends the following classifications.
— Lang crossing (1 mile below Spaulding Dam) to 1/2 mile below Fall Creek, 5 miles: wild.
— 1/2 mile below Fall Creek to Poorman Creek (1 mile below Washington), 6.5 miles: recreational. Roads and
development in this reach are compatible with the recreational classification.

— Poorman Creek to Edwards crossing, 12.5 miles: wild. This superlative section of river is one of the outstanding, undeveloped canyons in the middle elevations of the Sierra. Though some logging roads have approached the edge of this corridor, and one house lies along the river, development or open roads do not intrude, and the area meets the guideline of “generally inaccessible.” Precedents exist for wild classification on rivers with similar minor development, including such prestigious members of the system as the Middle Fork Salmon in Idaho and the Rogue in Oregon.

— Edwards crossing to Bridgeport, 14.5 miles: scenic. With almost no development along the river and no roads paralleling it, this section is crossed by only three bridges.

— Bridgeport to Englebright Reservoir, 0.5 miles: recreational. This section is the locus of the South Yuba River State Park and receives much recreational activity.

— Humbug Creek, North Bloomfield Road to South Yuba River, 2 miles: wild.

— Total: 39 miles of South Yuba River, 2 miles of Humbug Creek.

All of these classifications accommodate private land uses as permitted under existing county zoning. They likewise accommodate Forest Service, BLM, and California Parks and Recreation existing and planned uses. No logging on National Forest lands within the corridor form Poorman Creek to Edwards crossing would be allowed, but the Forest Service has already planned to severely restrict logging in this area. Private forest lands will remain under the regulations of the State Forest Practices Act (see Part 3—Effects of Designation). This section and Lang crossing to 1/2 mile below Fall Creek would be closed to new mining claims, but existing mining would be allowed to continue. Elsewhere, mining regulations would be unchanged. “Recreational” mining—which constitutes most of the mining now done below Edwards crossing—would be allowed to continue.
Recommended Wild and Scenic River Classifications
Management to Protect the River

Of important concern to landowners and other people is the question: How will lands along the river be managed after Wild and Scenic River designation?

Private lands will continue to be governed, as they now are, by county zoning and regulations (see Part 1-Land Ownership-Private). These regulations effectively protect wild and scenic values of the corridor, and they compare favorably to regulations for private land along other National Wild and Scenic Rivers.

Timber harvesting on private forest land would continue to be regulated by the State Forest Practices Act. This law requires setbacks and special planning for logging within 200 feet of designated rivers.

The management of federal land is a separate matter. The Forest Service and BLM at the national level have adopted guidelines for management of their lands when included in a Wild and Scenic River corridor. Because of the land management policies already set in place by the Tahoe National Forest, BLM, and the California Department of Parks and Recreation, little change in management of land would occur with wild and scenic designation.

The following management guidelines are excerpted from the Forest Service Land and Resource Management Handbook. BLM’s guidelines are similar. These apply only to federally owned land—not to private land.

Recreational River Segments, Standards for Management of Federal Lands

**Timber Production:** Timber harvesting is allowed under standard restrictions to protect the immediate river environment, water quality, scenic, fish and wildlife, and other values.

**Water supply:** Existing low dams, diversion works, rip rap, and other minor structures are allowed, provided the waterway remains generally natural in appearance. New structures are prohibited.
Along the South Yuba, several tributaries were also found eligible for National Wild and Scenic River designation by the Forest Service. This waterfall can be seen on Humbug Creek, just upstream from its confluence with the South Yuba.
Hydroelectric power: No development is allowed.

Flood control: Existing flood control works may be maintained. New structures are prohibited.

Mining: New mining claims and mineral leases are allowed, and existing operations are allowed to continue. Mineral activity must be conducted in a manner that minimizes surface disturbance, sedimentation and pollution, and visual impairment.

Road construction: Paralleling roads or railroads could be constructed on one or both banks. There can be several bridge crossings and numerous river access points.

Grazing: Lands may be managed for grazing use.

Recreation development: Campgrounds and picnic areas may be established close to the river.

Utilities: New transmission lines, gas lines, water lines, etc. are discouraged. Where no reasonable alternative exists, additional or new facilities should be restricted to existing right-of-ways.

Motorized travel: Motorized travel on land or water may be permitted, prohibited, or restricted. Controls will usually be similar to those governing surrounding lands and waters.

Scenic River Segments, Standards for Management of Federal Lands

Timber Production: A wide range of silvicultural practices could be allowed, provided that such practices have no substantial adverse effect on the river and its immediate environment. The river area should be maintained in its near natural environment.

Water supply: All water supply dams and major diversions are prohibited.

Hydroelectric power: Same as for recreational rivers.

Flood control: Flood control dams and levees are prohibited.

Mining: New mining claims and mineral leases could be allowed, and existing operations could be allowed to continue. Mineral activity must be conducted in a manner that minimizes surface disturbance, sedimentation, pollution, and visual impairment.
Road Construction: Roads may occasionally bridge the river area, and short stretches of conspicuous or longer stretches of inconspicuous and well-screened roads or screened railroads could be allowed.

Grazing: Same as for recreational rivers.

Recreational development: Larger scale public use facilities, such as moderate size campgrounds, public information centers, and administrative headquarters are allowed if structures are screened from the river.

Utilities: Same as for recreational rivers.

Motorized Travel: May be permitted, prohibited, or restricted on land or water to protect the river values.

Wild River Segments, Standards for Management of Federal Lands

Timber production: Cutting of trees will not be permitted except when needed in association with a primitive recreation experience (such as clearing for trails and protection of users) or to protect the environment (such as fire control).

Water supply: Same as for scenic rivers.

Hydroelectric power: Same as for recreational rivers.

Flood control: Same as for scenic rivers.

Mining: New mining claims and mineral leases would be prohibited within 1/4 mile of the river. Other existing mining activity would be allowed to continue. Existing mining activity would have to be conducted in a manner that minimizes surface disturbance, sedimentation, and visual impairment. Reasonable access would be permitted.

Road construction: No roads or other provisions for overland motorized travel would be permitted within a narrow incised river valley or, if the river valley is broad, within 1/4 mile of the river bank. A few inconspicuous roads leading to the boundary of the river area at the time of the study will not disqualify wild river classification. Also, unobtrusive trail bridges could be allowed.

Grazing: Same as for recreational rivers.

Recreational development: Major public use areas, such as large campgrounds, interpretive centers, or administrative
headquarters are located outside the wild river area. Simple comfort and convenience facilities, such as fireplaces or shelters, may be provided as necessary within the river area.

**Utilities:** Same as for recreational rivers.

**Motorized Travel:** Could be permitted on land or water, but is generally not compatible with this classification.

**Administration**

The Tahoe National Forest would administer the South Yuba Wild and Scenic River from Lang crossing to the Forest Service boundary above Humbug Creek, as the agency already manages over half of the corridor, and the administrative tasks would all be in regard to those public lands. The remaining reach would be administered by the Bureau of Land Management and the California Department of Parks and Recreation under a joint management agreement that already exists. Private lands throughout the designated reach would be subject only to the existing land use regulations of Nevada County.

**A Management Plan for Public Lands**

After designation, the administering federal agency would prepare a detailed management plan to address questions of maintenance and patrol, trail development, and other aspects of public land use. SYRCL recommends that a committee including landowners, conservation groups, resource industries, and recreational users be formed to advise the agencies during development of the plan following Wild and Scenic River designation.

**Alternatives to National Wild and Scenic River Designation**

National river designation is the best and most appropriate means to protect the South Yuba. Alternatives, however, include the following.
State Wild and Scenic River Designation

A State Wild and Scenic Rivers Act (ch. 1.4 commencing with Sec. 5093.50 Div. 5, P.R.C.) was established under California law in 1972 and includes four major rivers in the north coast region plus the lower American River in Sacramento, the North Fork American, and the East Fork Carson and West Fork Walker rivers on the east side of the Sierra Nevada. State designation sets California policy for prohibiting new dams, but repeated cases have shown that state designation is unable to stop FERC from issuing licenses for hydroelectric projects. Proposed hydroelectric projects on the New River in North Carolina and the Klamath in Oregon are among many clear illustrations of this situation. The Rock Creek case in California further confirmed the state's inability to supersede FERC in decisions regarding development on rivers.

In addition to this concern, the California Wild and Scenic Rivers System receives scant attention from state government. No personnel are assigned to the program, routine requests for information go unanswered, and the state designated rivers are regarded as "self-administering." Thus, the likelihood of quality management through the state program is not good.

South Yuba River State Park Expansion

California state parks, in contrast, are generally well managed, even with the extreme budget cuts of recent years. The South Yuba River State Park project is now planned to extend 21 miles from the river's lowest reach at Englebright Reservoir to Humbug Creek. Once established, park status will provide protection for the river, though not as securely as the protection of National Wild and Scenic River designation, owing to the lack of a federal mandate and the possibility of state policy changes.

Nonetheless, the park could be extended upriver from Humbug Creek in lieu of National River designation. This would
offer additional protection to the critical Humbug-Washington reach and would require the U.S. Forest Service to deed lands of the extended corridor over to the state. It is assumed that any extension would not affect private landowners in the Washington area, and that no condemnation of land would be used in any event. Expansion of the park is not a preferred alternative, however, it is one that may be pursued if National River designation does not occur. This alternative is particularly likely if the Forest Service does not recommend designation—an action that would inspire little confidence that the agency would seek to protect the National Forest land from threats of dams.

**Recommendations for Designation**

The South Yuba River Citizens League (SYRCL) has found the South Yuba to be eminently eligible and suitable for protection in the National Wild and Scenic Rivers System. SYRCL recommends that the South Yuba be designated from Lang crossing downstream to the backwater of Englebright Reservoir, a distance of 39 miles, and that Humbug Creek be designated for 2 miles from the South Yuba River up to North Bloomfield Road. The wild, scenic, and recreational classifications recommended by SYRCL are covered in Part 3—Classification.

An upper reach of the South Yuba, along with the tributaries of Lower Castle Creek and Fordyce Creek, are eligible according to the Forest Service, and suitable according to this study. SYRCL does not propose designation of those segments but rather focuses on the most critical reach of river and the stretch that is threatened as a free-flowing waterway. Designation of the recommended section covers only 39 of 207 miles on the South, Middle, North, and main stem Yuba, and SYRCL believes that this proposal is a conservative approach that accepts many compromises to various uses of the river and to other reaches that will not be protected.

The League believes that only through National Wild and Scenic River designation will the South Yuba effectively be protected from new and unwise dam proposals. Current uses of the river and the land along it would not be threatened by designation.
The League further believes that this designation offers the most efficient and cost-effective form of management for the river corridor, and that the people of the local counties, the state, and the nation will benefit by permanent protection of this outstanding waterway.
The South Yuba River Citizens League believes that protection of the river, as it is, will best serve the people of the local counties, the state, and the nation. Wild and scenic designation will benefit landowners and visitors alike, while still meeting important water supply, flood control, and hydroelectric needs.
Conclusion: A River for the Future

The South Yuba is already a hard-working river. It has been a working river since the first dam at the Spaulding site was built in 1892, and even before that, during the Gold Rush. Yet qualities remain that make this river outstanding in the natural rivers estate of California and the nation.

This river can be protected without conflict to landowners or to the realistic and wise use of water. Indeed, the river's protection is critical to both. Protection is required for landowners' security against the threat of unnecessary dams, for recreation and enjoyment, and for the South Yuba ecosystem, along with nourishing springtime flows that lend vitality to downstream life and water supplies in the lower river and Delta.

Protection is needed to provide for growing recreational needs of local residents and visitors alike, and to serve a local economy that is increasingly based on recreation, tourism, and the quality of life in Nevada County and in the Sierra Nevada.

This third-largest river system of the Sierra Nevada lacks protection of any type, though many sections of the waterway are worthy. The South Yuba is developed and manipulated for intensive uses, yet not one mile has been protected as a free-flowing river.

To sustain the South Yuba as it exists may be perceived as a conflict to one group of downriver interests. The supporters of protection disagree. The river as we know it is valuable and useful to all. No real demands for flood control, water supply, or electricity need go unmet. Various alternatives can accommodate all of those needs at far less expense and destruction than by damming the South Yuba again.
For more than 100 years, our society has celebrated and romanticized the era of the Gold Rush in California, which led to settlement by white people, to a cash economy, and to a tamed native landscape literally leveled by mammoth hydraulic hoses. The Gold Rush gave way to the agricultural economy, which later grew into the massive, diverse, consumer economy that marks the California of today. The growth has been continuous and has benefitted many people, but remnants of the natural landscape benefit many people as well.

While the South Yuba contributed to the early wealth of the state with the gold that was mined, more and more people are now enjoying the greatest wealth of the river. It offers a chance to escape from the pressures of the urban world and to enjoy a piece of the original California—a California that can still be found, even though it is vanishing rapidly.

We have celebrated the Gold Rush well, and perhaps now it is time to celebrate a new era, to recognize a California different from the boom towns of the miners, from the rice fields and hay fields of the irrigators, and even from the growing sprawl of cities. Without turning our backs on those histories or abandoning anything we have done, we have the opportunity, at the South Yuba River, to celebrate California as a native place, as a canyon and a river that shows the best of old-time California while at the same time hosting ecosystems that must sustain us forever into the future.

The South Yuba has done its part in contributing to early settlement and wealth; it has provided its share of hydroelectric power and water supplies to many homes and farms. It will continue to do so. But now, before it is too late, the South Yuba can also be protected in order to provide for the needs of an even more modern California. Here, the natural qualities that remain can be safeguarded for the urgent needs of today and of the future. These needs are not for one more dam among 1,600 others that block rivers across the state, but for a rare place of natural wonder, for a river that runs free, for a flow that nourishes a troubled ecosystem lying downstream where endangered salmon strive to spawn. To use this river otherwise would cost a great deal. To save it will cost next to nothing. We will simply leave one of California’s finer rivers the way it is.
Selected Sources


Nevada County Zoning Ordinances.


People Consulted

Bob Aldridge, Department of Water Resources Water Bank
Betty Andrews, Philip Williams and Associates
David Baringer, State Water Resources Control Board
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Rusty Wire, California Energy Commission
Walter Yep, Army Corps of Engineers
Bob Zettlemoyer, Department of Water Resources
Acknowledgments

The efforts of many dedicated South Yuba River supporters made this report possible. Thanks to the knowledgeable people listed in the sources who shared their expertise by providing information.

Mary Haughey, executive director of the South Yuba River Citizens League, conceived of and initiated the project, raised funds necessary to finance the report, offered guidance about whom to interview, and provided critical background information. She inspired us as she inspires SYRCL members with her boundless energy and commitment to protecting the South Yuba. Dr. Roger Hicks, President of the organization, likewise provided insight and encouragement.

Janet Cohen, SYRCL office manager, deserves thanks for her continuous help with numerous odds and ends—including the enlistment of dozens of volunteer typists—and for her levity and support in all circumstances.

Charly Price and Delo Rio-Price of Arts Arrived provided their graphics expertise to produce the maps and to help design this document.

Betty Andrews, a civil engineer with Philip Williams and Associates, expertly analyzed hydrologic matters and several aspects of the water projects threatening the South Yuba.

John Cone, an urban economics consultant, donated his time and experience in analysis of the economic importance of the South Yuba to Nevada County.

Judy Patton used her professional skills in editing the entire manuscript and made many improvements to the text.

SYRCL board member Joe Limov helped with production details, including finding a good printer for this document.

Ben Perkowski, SYRCL intern during summer 1992, began research on many aspects of the river.

SYRCL volunteer typists Michael Brackney, Keri Brown, Annette Dunklin, Donna Joy, Liz Knapp, Bob Lobell, Gary Moon, Corrie Upham, and Dixie Waugh donated many hours of their time to help with the efficient production of several drafts of this report. Our deadlines could not have been met without their generous help. Michael Brackney also provided assistance in editing.

Several people reviewed a draft of the entire document and offered helpful suggestions. These include Dr. Roger Hicks, president of the SYRCL board; Mary Haughey, executive director of SYRCL; Katie Burdick, environmental consultant; Bill Malgren and Janaia Donaldson, local residents; Ron Stork and Steve Evans of Friends of the River; and Jerry Meral, executive director of the Planning and Conservation League. Twenty-five experts in various technical fields reviewed
portions of the draft for accuracy. Several SYRCL board members reviewed parts of the report as well. Their attention to our work is greatly appreciated.

Molly Gallagher collected information about recreational use. Alan Banfield, Bob Lickter, Hank Meals, Joy Phillips, Linda Rachmel, and Raelynn Travers offered the use of their excellent photographs for this report. Diane Cross also helped with photographs.

While they travelled abroad for several months, Bill Heck and his daughters Sarah, Molly, and Emma graciously donated the use of their Nevada City home to the report authors.

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Authors of the Report

Tim Palmer received a degree in landscape architecture from Pennsylvania State University and worked for eight years as a professional planner on a wide range of environmental and land-use topics. Since his full-time writing career began in 1980, he has had eight books published, including the definitive report on the National Wild and Scenic Rivers System, The Wild and Scenic Rivers of America. His Endangered Rivers and the Conservation Movement presents the history of river conservation. He also wrote The Sierra Nevada, A Mountain Journey, The Snake River, Window to the West; and edited California's Threatened Environment, released in 1993. In various roles, he has assisted local groups in river protection for the past twenty years, including efforts on the Kings River in California that led to National Wild and Scenic River designation in 1987. He received the Lifetime Achievement Award from the American Rivers organization in 1988.

Ann Vileisis studied history and environmental studies at Yale University and received a masters degree from Utah State University in western history in 1992. Pursuing interests in environmental policy and nature writing, she has worked as an intern at the National Audubon Society in Washington, D.C., at Canyonlands National Park, and at High Country News. For three years, she guided commercial river trips in Colorado, and for the past four years she has led river and wilderness trips for Outward Bound in Colorado, Utah, and Alaska. She has written a history of the Denver and Rio Grande Western Railroad under contract to the Bureau of Land Management and is currently working on an environmental history of wetlands in America.
The South Yuba River offers a wealth of values to people in northern California and throughout the state. The river is a recreational paradise for residents and visitors alike; it supports an important part of the local economy; and it is vital to mountain and foothill ecosystems of the Sierra Nevada.

The river has been threatened by new hydroelectric projects and by large dam proposals—none of them feasible but all casting an uncertain shadow on the fate of this extraordinary river.

To illuminate the choices before us, the South Yuba River Citizens League has prepared this report on all aspects of the river and offers a plan for protection that will benefit everyone.