# Salmon Stranding Loss Reduction

## Fluctuating flows can strand juvenile and adult salmon.

### Background

Flow changes have important effects on aquatic organisms. Rapid reductions in flow can strand fish, especially salmon fry. Various factors affect the stranding potential, including range, amount, and rate of flow reduction, bank slope, channel configuration, substrate, location, season, time of day, and size of fish. Flow reductions can result from runoff, flood control operations, power operations, and minimum-flow schedule changes.

### Project

Develop operational criteria and manage flow reductions to minimize salmon losses due to stranding. Identify and modify channel areas conducive to stranding losses.

### Benefits

Survival would increase during key salmon life stages.

### Costs and Funding Sources

Costs are unknown. Channel surveys could be combined with other projects. Criteria development and operational impacts will need to be considered.

Some potential funding sources are the DWR Delta Pumps Mitigation Program, Tracy Pumps Mitigation Funds, and CVPIA restoration funds.

# Salmon Stranding Loss Reduction

## Related Activities

| San Joaquin River Management Plan Recommendation | Page in This Report |
|---|---|
| Channel and Spawning Gravel Work | 22 |
| Real-Time Water Quality Management Network, Phases 1 and 2 | 62, 64 |
| Reservoir Flood Release Coordination | 66 |

- Central Valley Project Improvement Act, Section 3406(b)(9)
- Department of Fish and Game *Central Valley Stream Action Plan.*

## Conflict and Resolutions

Operational constraints and loss of flexibility may affect potential improvements and flood control operations. Assessment of alternatives may result in long-term solutions.

## Implementation

This is an ongoing operational concern. Environmental documentation requirements are unknown but some documentation will likely be needed for channel work and any changes in relicensing or water right conditions. Legislation needs are unknown.

Regulatory agencies are the Federal Energy Regulatory Commission and State Water Resources Control Board. The U.S. Army Corps of Engineers could be involved in flood control releases. The Department of Fish and Game and U.S. Fish and Wildlife Service are involved in developing flow schedules.

# Salmon Straying Reduction (Adults)

Migrating adult Chinook salmon stray between drainage tributaries and into sloughs that contain agricultural waste water. Excessive straying contributes to reduced recruitment and loss of genetic integrity.

## Background

Straying is caused by inadequate attraction flows, unscreened agricultural diversions and drains, and out-planting of smolts and fry, particularly in downstream locations and in the Delta. When salmon smolts are planted in the Delta, they stray to a greater extent between the San Joaquin and Sacramento river basins when they return as adults.

## Project

Provide adequate attraction flows during the fall, reduce operational releases to minor streams such as Dry Creek, screen diversions and drains, and eliminate out-planting of both San Joaquin and Sacramento river fish at locations that result in straying between basins and tributaries.

## Benefits

If straying is reduced substantially, benefits will include increased recruitment and maintenance of remaining genetic integrity of San Joaquin stocks.

## Costs and Funding Sources

Costs are yet to be determined. Potential funding sources include sections of the Central Valley Project Improvement Act pertaining to screening and water purchases. Other funding sources have not yet been identified.

# Salmon Straying Reduction (Adults)

## Related Activities

| San Joaquin River Management Plan Recommendation | Page in This Report |
|---|---|
| Basin Flow and Delta Export Coordination | 18 |
| Genetic Maintenance | 46 |
| Riparian Diversion — Pilot Screening Projects | 72 |
| Salmon Attraction/Migration/Spawning Flows (Fall) | 78 |
| Salmon Outmigration Flows (Spring) | 86 |
| San Joaquin Fall Barrier at Merced River | 100 |

## Conflicts and Resolutions

Conflicts may occur if increasing attraction flows results in reducing water available for agricultural and domestic purposes or if diverters are required to bear the entire cost of screening. Conflicts may also result due to reduced survival of hatchery-produced fish. Eliminating out-planting would preclude "trap and truck" methods of reducing smolt and fry mortality.

The first two types of conflicts could be resolved by purchasing water, enhancing water use or reuse, and funding screens through the Central Valley Project Improvement Act. Conflicts with hatchery objectives and trap-and-truck strategies might be partially resolved by increasing survival and returns through measures to improve rearing and outmigration conditions in upstream locations.

## Implementation

Although some aspects of this proposal could be implemented in the short term, addressing all the factors that influence straying will be a long-term effort. Some site-specific environmental documentation could be required for screening. Legislation may be necessary for State contribution to funding by participating State agencies.

Implementation would require cooperation between State and Federal wildlife and water management agencies, irrigation districts, and water-user groups. If funding were provided under the Central Valley Project Improvement Act, the U.S. Fish and Wildlife Service would probably be the lead agency. In the interim, continue to use "4-Pumps" mitigation to fund installation and operation of the Hills Ferry barrier on the San Joaquin River and land acquisition for the site until the comprehensive plan (3406(c)(1)) is completed.

# Salt Export Enhancement — Wet Year Water Delivery Manipulations

San Joaquin Basin soils are accumulating salt due to an imbalance between influx and outflow, with resulting problems for crop production, fish, and wildlife.

## Background

Prior to water storage system construction, the San Joaquin, Grasslands, and Tulare Lake basins flooded frequently, enabling salt from the floodplain to be leached and mobilized, discharging to the Delta and Pacific Ocean. With most of these basins protected from floods and with irrigation supplies bearing salts from the Delta, the basins now accumulate salt faster and are leached less often. This might be partly reversed if the more abundant low-salinity water, which exceeds storage capacity during high-flow years, were managed to simulate historical conditions and if the surplus water were routed to former floodplain areas that are now effectively never overflowed.

## Project

Major water distributors would manage water deliveries in wet years to only meet crop and leaching requirements not met by precipitation. Water in excess of users' needs would be directed within the basin to areas where its application would most increase the efficiency of mobilizing salts and, in conjunction with Delta barriers and coordinated operation of major diversions, increase the amount of salt transported out of the basin via the estuary.

## Benefits

In the occasional wet year, excess assimilative capacity is available to transport salts that have accumulated over several dry years. By better managing wet-year flows, the long-term salt balance should be restored to near equilibrium. The overall benefit is moderate and would require coordination with CVP/SWP Delta export operations to ensure the mobilized salts mobilized are not re-diverted to the basin but flow to the Pacific Ocean.

## Costs and Funding Sources

Costs are unknown, but because existing distribution systems are sized for low-flow conditions, this project would require acquisition of flow easements and other major institutional changes.

If a truly multi-objective proposal were agreed to, this project might be funded by the Central Valley Project Improvement Act or by funds from a statewide bond issue.

## Salt Export Enhancement — Wet Year Water Delivery Manipulations

### Related Activities

Examples of preferred distribution would be to deliver surplus water to areas of high ground water, where the applied water would temporarily enhance waterfowl habitat and increase the gradient carrying saline ground water toward the river. Or, the surplus water could be applied to areas where surface salts have accumulated; the fresh water would dissolve the surface salts and be directed to the river at a time when assimilative capacity was high. The effect would be to increase transport out of the basin.

### Conflicts and Resolutions

Land use in areas scheduled to be leached by floodwater would be constrained (no winter crops planted, a cover crop in place, or other conditions to permit safe overflow), which would be costly to landowners. Fishery interests would be concerned that fish might be stranded, and waterfowl advocates would worry that toxic materials might enter the receding floodwater. Waterfowl distribution might change, to the detriment of birds or hunters. These interest groups would need to be satisfied that the long-term benefit of a stable salt balance more than offset the short-term risk to fish or wildlife and their users.

The most effective application of this proposal would depend on information not yet assembled regarding locations where ground water gradients might be best manipulated or dissolved surface salts could be conveyed to the river without harm to intervening lands.

### Implementation

This long-term action calls for a commitment by many parties to collaborate in the common interest. An EIR/EIS would be required, since this would be a major action with new and difficult-to-foresee impacts. New legislation would probably be needed, as the scope of this proposal makes a single lead agency unlikely.

This is the sort of multi-objective project that is difficult to carry out under a single lead agency, which has dominant purpose. Implementing agencies would need to have responsibility for water quality, flood management, reimbursing agricultural users for crop loss, waterfowl management, and ground water recharge. The plan must give careful attention and fair weight to all these concerns.

# San Joaquin Fall Barrier at Merced River

Fall-run Chinook salmon ascending the San Joaquin River system above the Merced River have no access to suitable spawning areas. Trapping adults in sloughs and other channels has been expensive and relatively ineffective. Water sources and water volume have tended to attract migrating salmon to unsuitable areas.

## Background

Since Friant Dam and other mainstem dams and diversions began operating, Chinook salmon have been denied access to the historically important spawning reach between Friant and Highway 41. This area formerly contained 40% of the salmon spawning area in the San Joaquin River Management Plan region. From 1988 to 1991, the Department of Fish and Game salvaged straying adults at traps near Los Banos, upstream of the Merced River, and recovered eggs to be hatched and reared at the Merced River Fish Facility. It was estimated that only about half of the salmon were actually recovered, and egg quality was often poor because of poor water quality. Fish migration into these sloughs was precluded in 1992 by an electrical barrier installed near the Merced River. A physical barrier was used in 1993 and 1994.

## Project

Until suitable spawning areas are again accessible in the Friant area, provide for annual installation during October to December of a barrier to divert adult salmon to the Merced River. Purchase a 10-acre site at the confluence of the San Joaquin River and the Merced River for barrier installation and operation.

## Benefits

This project will reduce loss of San Joaquin Basin salmon and improve operation of salmon production facilities on the Merced River.

## Costs and Funding Sources

A 5-year operation and land acquisition would cost about $350,000, with about $50,000/ year operating cost after 5 years.

Potential funding sources include State mitigation funds and CVPIA restoration funds.

# San Joaquin Fall Barrier at Merced River

## Related Activities

| San Joaquin River Management Plan Recommendation | Page in This Report |
|---|---|
| Basin Flow and Delta Export Coordination | 18 |
| Channel and Spawning Gravel Work | 22 |
| Dissolved Oxygen and Circulation Solutions | 26 |
| Fishing Regulation Enforcement | 42 |
| Real-Time Water Quality Management Network, Phases 1 and 2 | 62, 64 |
| Salmon — Artificial Production | 74 |
| Salmon Attraction/Migration/Spawning Flows (Fall) | 78 |

- San Joaquin River Management Program *Salmon Action Plan*, Section 2g.
- Central Valley Project Improvement Act investigation of measures to re-establish salmon runs near Friant.
- Department of Fish and Game *Central Valley Stream Action Plan.*

## Potential Conflicts and Resolutions

Potential conflicts have not been identified. Boaters can portage around the barrier, or barrier panels can be removed temporarily to allow boats to pass.

## Implementation

This ongoing annual project could extend more than 5 years. Environmental documentation and permits would be similar to that for existing Department of Fish and Game operations. Legislation could provide for funding for long-term operation and site acquisition. The Department of Fish and Game is the implementing agency.

# San Joaquin River Overflow onto Riparian and Wetland Areas

A demonstration project that provides for distribution of peak streamflows to adjacent wildlife refuges would address several problems:

- Major floodflows along the San Joaquin mainstem often exceed the design flow capacity of the floodway. Lesser flows that exceed downstream flow needs often cause seepage damage to land adjacent to the floodway.
- Wetlands adjacent to the floodway often have less than optimum water supply and would benefit from increased availability of high quality water.
- Providing an adequate imported wetland water supply exacerbates water shortages for other purposes in the San Joaquin Valley. Furthermore, delivery via Delta-Mendota Canal results in importation of salt and increased transfer of water across the Delta, with consequent fishery problems.
- There is a serious problem of high salinity in the river due primarily to entry of high salt loads in drainage from the westside wetland and agricultural drainers. This results in a burden on New Melones reservoir for dilution flows to meet the Vernalis water quality standard.
- High streamflows after winter rains are sometimes followed by spring flows that are less than optimum for downstream salmon migration.

## Background

The U.S. Army Corps of Engineers investigated the hydraulic potential for this demonstration project under its San Joaquin River Mainstem and Tributaries Reconnaissance Investigation. The study indicated that overflow weirs, conveyance facilities, and some impoundment levees would make it possible to overflow between 100,000 and 200,000 acre-feet of excess flow onto wildlife refuges and other undeveloped wetland and riparian areas. The water could then be released back to the river when river stages subsided, or part could be held for later release to benefit fish and water quality. A small-scale demonstration of this concept has been proposed, with funding requested for the next fiscal year and supported by the California Water Commission.

## Project

Develop the details and implement the weirs, distribution system, and temporary retention facilities to optimize use of high streamflows to address all the problems in a balanced manner, consistent with flooding and retention restraints on the affected land. Basically, the goal is to achieve partial restoration of historical wet-year flooding of these lands in a controlled manner. Most of the land is either in government ownership or in private wetland ownership that can cooperate with this proposal. No involuntary participation is proposed.

# San Joaquin River Overflow onto Riparian and Wetland Areas

## Benefits

The project will make a major contribution toward alleviating the five problem areas discussed.

## Cost and Funding Sources

Capital cost is estimated at $6 million, not including land acquisitions.

## Related Activities

This proposal goes beyond, but is compatible with, Central Valley Project Improvement Act and U.S. Bureau of Reclamation proposals to restore water supply and water quality to valley wetlands.

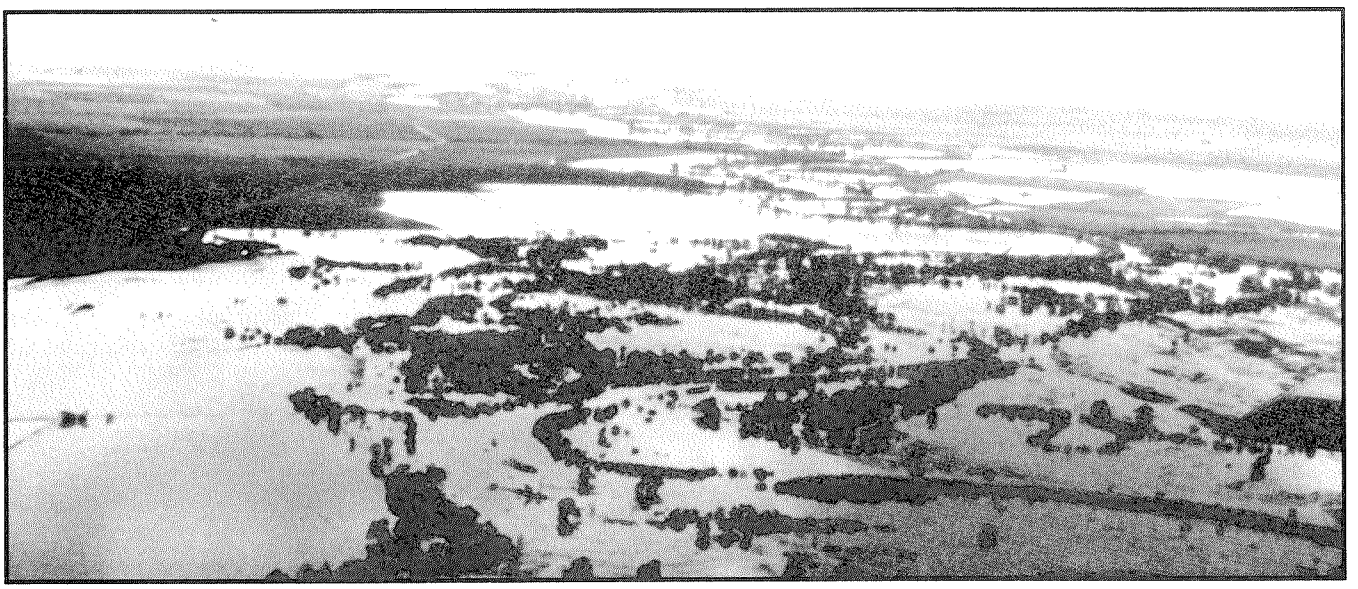
## Conflicts and Resolutions

In developing a detailed plan, it will be necessary to balance and limit the proposal to optimize aggregate benefits to all interests and to avoid problems for any interest that are not offset by benefits to that interest. This proposal needs to be sized and operated to prevent its interfering with existing water rights.

Potential public health issues related to possible increased populations of mosquitoes would need to be addressed.

## Implementation

The project should be planned as a total project, but may be implemented in stages. The project will require legislation and designation of some sort of consortium as lead agency.



*Flooded land along the San Joaquin River, near the Merced River confluence.*

# San Joaquin River Parkway Plan

The San Joaquin River Parkway Plan, developed by State and local entities to address problems in the San Joaquin River between Friant Dam and Highway 99, is being implemented.

## Background

Several unfavorable conditions exist in the San Joaquin River between Friant Dam and State Highway 99: degraded riparian habitat, insufficient water quantity, threat to water quality, reduced floodflow carrying capacity, and inadequate opportunity for recreation. A significant, recent increase in urban population on both sides of the river is expected to continue.

Through efforts by communities in Fresno and Madera counties, the San Joaquin River Parkway Task Force was created in 1990 by State statute (AB 3121, Costa). The San Joaquin River Management Program, along with 24 agencies and organizations, completed the San Joaquin River Parkway Plan in March 1992. The San Joaquin River Conservancy was created in 1992 by State statute (AB 2432, Costa) to coordinate parkway implementation and management.

Establishing the San Joaquin River Parkway Conservancy will meet many of the objectives of San Joaquin River Management Plan for this section of the river (AB3048).

## Project

Continue the existing San Joaquin River Parkway project by:

- Providing resources to the San Joaquin River Conservancy to assist in its overall efforts, including natural resource surveys and environmental studies that may be necessary for successful implementation of the parkway.
- Supporting parkway projects that further objectives of the San Joaquin River Management Plan.
- Coordinating efforts between State and Federal agencies to support establishment of the San Joaquin River Parkway.

## San Joaquin River Parkway Plan

### Benefits

The San Joaquin River Parkway provides for preservation of habitat through establishment of ecological reserves, restoration of degraded riparian habitat, protection of the floodplain, and appropriate public access. Regional economic and social benefits are also expected as a result of establishing the greenway.

### Costs and Funding Sources

Land acquisition costs are estimated to be about $50 million over a 20- to 30-year period. The San Joaquin River Conservancy is seeking funds in the range of $250,000 for assistance with environmental studies.

### Related Activities

Activities of the San Joaquin River Conservancy and those studies and projects that may result from the Central Valley Project Improvement Act should be considered.

Since 1988, more than 800 acres has been acquired in four purchases by the Wildlife Conservation Board. Funding and approval have been obtained for about 4 miles of multi-purpose trails (not in sensitive riparian areas). Funding for these projects has come from a variety of sources, including the California Wildlife Coastal and Parks Initiative, the Habitat Conservation Fund, CalTrans Transportation Enhancement Activities, and the San Joaquin River Parkway and Conservation Trust.

Restoration of anadromous fisheries and other resources through development and implementation of the comprehensive plan (CVPIA Section 3406 (c)(1)).

### Potential Conflicts and Resolutions

The County of Madera and the City of Fresno are updating their General Plans. These plans should include goals and policies to advance establishment of the San Joaquin River Parkway and objectives of the San Joaquin River Management Program.

### Implementation

This is continued support of an existing long-term project.

# Sediment Control — Watershed and Watercourse Management

## Excessive sediment is polluting the San Joaquin River.

### Background

Significant amounts of sediment are delivered to the San Joaquin River from watersheds that do not have storage facilities: Corral Hollow, Lone Tree, Hospital, Ingram, Del Puerto, Salado, Crow, Orestimba, Garza, Quinto, Ortigalita, Panoche, Tumey Gulch, Arroyo Hondo, Cantua, and Salt creeks. With few exceptions, these Coast Range creek channels have been obliterated by grading and cultivation once they reach the valley floor. Riparian habitat along the creeks has been cleared or eliminated by agriculture and/or excessive grazing. When heavy storms yield runoff down these creeks, the high flows travel across cultivated land, cause local flooding, and deliver large amounts of sediment to the San Joaquin River. The sediment is itself a pollutant, but soil particles also have pesticides adhering to them that contaminate the food chain.

Farming practices can also increase sediment transport. Irrigation without tail-water recovery basins and lack of ground cover while land is fallow increase the risk of sedimentation in the river.

### Project

Acquire rights of way for watercourses capable of carrying stormflow safely to the San Joaquin River, while allowing sediment to drop out. The proposal also contemplates integrating on-farm detention basins with created wetland habitat feeding into the new channel system and a restored riparian buffer strip along these channels to filter overland flow that reaches them.

### Benefits

Benefits will be significantly reduced sedimentation and soil-bound pollution in the San Joaquin River and its tributaries, enhanced quantity and quality of wildlife habitat, and reduced flood damage on agricultural land and in towns like Patterson and Mendota.

### Costs and Funding Sources

This is a multi-million-dollar program. Sixteen major streams would need corridors purchased, channels rebuilt, and habitat restored. The corridors would be about 200 feet wide by 15 miles long — about 25 acres per mile times 240 miles of stream, for a total of 6,000 acres. Riparian habitat restoration costs about $6,000 per acre, so development costs might total $36 million. Acquisition cost might be $2,000 per acre, or $12 million. Operating the 6,000 scattered acres might be accomplished through contract with adjacent landowners or resource conservation districts, but annual operating costs might be $50 per acre ($300,000 annually), which could be covered by a trust fund of about $5 million. The total would be about $53 million.

# Sediment Control — Watershed and Watercourse Management

State funding for acquisition might come from statewide bond issues; federal funds might be available from Wetland Reserve Program, Conservation Reserve Program, or flood control funds.

## Related Activities

| San Joaquin River Management Plan Recommendation | Page in This Report |
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| Restoration of Converted Wetlands | 68 |
| Restoration of Riparian Corridor | 70 |
| Protection of Existing Wetlands | 168 |
| Riparian Habitat | 170 |
| Sensitive Species Habitat | 172 |

- 1994 Hydrologic Unit Area Projects, USDA Soil Conservation Service.

## Conflicts and Resolutions

Retiring 6,000 acres and establishing wildlife habitat in the midst of agricultural land will concern neighboring landholders, who can expect wildlife conflicts. Land management by resource conservation districts might offer some reassurance that property owners' concerns will be addressed.

Potential public health issues related to possible increased populations of mosquitoes would need to be addressed.

## Implementation

This is a long-term proposal, because to acquire right of way, restore channels, connect on-farm drainage systems, and restore riparian strips would occupy more than 5 years.

Acquisition and land use changes to benefit fish and wildlife would be exempt under CEQA, but to fully disclose potential impacts on sediment transport and adjacent property and to ensure mitigation measures are adopted, an EIR/EIS would be necessary.

Although agencies such as the Wildlife Conservation Board, Reclamation Board, and Department of Conservation have interests in and authority over the proposed corridors, none of them has explicit authority or dedicated funds for this purpose. To expedite an acquisition program, legislation with explicit authority and funding for one or all agencies would be needed.

If the post-acquisition land use were wildlife management, the Wildlife Conservation Board would be the implementing agency. If the focus were flood damage reduction, The Reclamation Board would be the implementing agency. If agricultural land conservation and sand/gravel resource conservation were the focus, the Soil Conservation Service and Department of Conservation would lead.

# Sediment Removal from San Joaquin River Mainstem

**Flood-carrying capacity of the designated floodway along the San Joaquin Valley floor has been substantially degraded below the design flow capacity established when flood protection facilities and floodway designations were authorized. A substantial portion of this degradation is due to aggradation of the channel by sediment deposition, which exacerbates bank erosion.**

## Background

There is no substantial or on-going program of aggradation control in the San Joaquin River along the valley floor, as there is in the Sacramento River. No local agency has authority or responsibility for San Joaquin River channel maintenance, except for the Lower Levee District, south of the Merced River.

Surveys by various agencies since the 1930s attest to substantial aggradation of the channel. For example, South Delta Water Agency and the Bureau of Reclamation (known at the time as the Water and Power Resources Service) prepared a report joint report in 1980[1]. Ground observations and periodic aerial surveys attest to the change in floodway habitat that has accompanied the channel aggradation. The area of floodway between levees has remained constant, but substantial areas of high-berm habitat in the floodway have been eroded and transformed into downstream low-level deposits, which grow more brush than trees. This habitat is inundated more often and for longer periods than the berms, with inadequate escape area for wildlife. The rise in channel bottom elevation has also blocked hydraulic continuity between oxbows and the river channel.

The reduction in channel flow capacity due to aggradation has increased the frequency and duration of water elevations that inundate the berms between the channel and the levee and thereby soak the levees and cause seepage damage landward of the levees. South Delta Water Agency estimated that in the southern portion of its jurisdiction, about 12,000 acres were inundated by seepage in 1983. Levees have failed repeatedly at streamflows substantially below design flow capacity.

The long-term market for sand and landfill material in San Joaquin Valley counties is substantial — asserted by industry representatives to be one-half to one million cubic yards in San Joaquin County alone. Much of this market is now met by scalping lands near the river. Some of this scalping is environmentally undesirable and conducive to changes in configuration of the river channel during floods, with consequent erosion and further downstream channel aggradation. Difficulties and up-front cost of an EIR and the permit process inhibit the industry from removing in-channel material.

1 Water and Power Resources Service and South Delta Water Agency. June 1980. *Report on the Effects of the Central Valley Project upon the Southern Delta Water Supply, Sacramento-San Joaquin River Delta, California.* Chapter VII, pg. 149.

# Sediment Removal from San Joaquin River Mainstem

## Project

The Advisory Council approved a demonstration project led by the Department of Water Resources and The Reclamation Board. The demonstration project will evaluate efficacy and permit problems and environmental protections required to reduce aggradation by removing sediment from suitable sites along the river and selling the material to bidders.

A substantial degree of aggradation control is expected with no long-term expenditure of government funds if the EIR and permit costs can be carried out by a facilitating agency and if up-front and ongoing costs of the facilitating agency are then recovered from bidders who will carry out the sediment removal and sale. These sediments would be largely submerged sediments and adjacent sandbars carried along the streambed by the flow.

## Benefits

This project can alleviate the problems described. Erosion control measures must also be developed, but they will probably have a much higher governmental cost. It is unlikely that aggradation can be reduced enough to avoid the need for the proposed project.

## Costs and Funding Sources

The project will cost about $90,000 initially, plus $9,000 for periodic (5-year intervals) maintenance.

## Related Activities

| San Joaquin River Management Plan Recommendation | Page in This Report |
|---|---|
| Dual-Purpose Floodway Proposal | 36 |
| In-Channel Aggradation Control (Demonstration Project) | 50 |

## Conflicts and Resolutions

The purpose of the demonstration project is partly to determine the extent of the sediment market and whether environmental concerns can be avoided or mitigated.

## Implementation

The Department of Water Resources has agreed to implement the demonstration.

# Stanislaus River Rock Hazard Solutions

Large boulders and rocks protruding from the Stanislaus River below Goodwin Dam pose a threat to users of the river under certain conditions.

## Background

This proposal began as a follow-up on an uncompleted mitigation objective for the New Melones project. New Melones Dam inundated a major whitewater run on the upper Stanislaus River. As mitigation for the loss of this resource, development of the Goodwin Canyon section of the lower Stanislaus was proposed. A 1977 *Lower Stanislaus River Master Plan* also addressed removal of hazardous boulders at four of seven rapid areas to promote rafting and kayaking. The U.S. Army Corps of Engineers has considered removing the boulders but has concluded that additional study is warranted.

## Project

Remove or modify hazardous rock formations in the Goodwin Canyon section of the Stanislaus River below Goodwin Dam. If that is not feasible, explore alternative solutions for the safety of river recreationists; examples include filling holes with additional rock and other material or creating a breakwater.

## Benefits

Rafters would benefit from an uninterrupted and safe whitewater area on the Stanislaus River, once one of the best whitewater rivers. Increased tourist economy and associated benefits may also result.

## Costs and Funding Sources

At one time, the Corps of Engineers suggested that the Army might be able to remove the rock for as little as $3,000 as part of a training exercise. This estimates appears to be somewhat low.

## Stanislaus River Rock Hazard Solutions

### Related Activities

No related activities have been identified.

### Conflicts and Resolutions

The U.S. Army Corps of Engineers has recently expressed at least four concerns regarding the rock removal.

- The Department of Fish and Game approved removing the rock, but there is no guarantee such work would not impact fisheries, causing need for additional mitigation.
- The Corps of Engineers may not be able to fully accommodate potential increases in recreation use at its Stanislaus River parks with current staffing and funding.
- At lower flows, increased use may impact public health and safety.
- Effects on stream mechanics and hydraulics are unknown; rock removal could result in increased bank erosion.

### Implementation

This would be a short-term action, with implementation time estimated at less than 2 years.

# Tuolumne River Regional Park Plan

Additional funding methods for future acquisition and continued maintenance and operation are crucial to prevent urban encroachment and commercial development and to ensure uninterrupted greenbelt space along the Tuolumne River near Modesto.

## Background

In 1966, a committee was formed to hire and work with a landscape architect to develop a plan for a Tuolumne River Regional Park. Objectives were to:

- Create a park that would provide unique recreational facilities in a pleasant, beautiful, and interesting environment, taking full advantage of the prime features of the river.
- Recognize all positive and negative aspects of the site, including prevailing winds, potential flood problems, sun orientation, topography, and need for connecting circulation within the overall site.
- Achieve the best possible juxtaposition of facilities in relationship to one another, to the site, and to surrounding land uses, both present and future.
- Provide easy access to facilities and sites, with minimum conflict between pedestrian and vehicular traffic, and to recognize in the circulation system the human tendency to find the shortest distance between two points within and beyond the site.

After 2 years of collecting ideas and citizens' comments, the Stanislaus County Board of Supervisors and the Modesto and Ceres City Councils adopted a plan. In 1972, a joint-powers agency was created, with administration assigned to the City of Modesto. Funding was to be contributed by each agency based on allocations from tax revenues. Development and land acquisition have proceeded with available funding, but Proposition 13 severely curtailed agency contributions and threatened operation and development of the park.

Tuolumne River Regional Park is along a 6-mile section of the Tuolumne River from Mitchell Road to Carpenter Road in urban Stanislaus County. The park consists of an impressive combination of open, flat floodplain; natural riverbanks and bluff areas covered with willow, maple, poplar, and oak trees; a large grove of valley oaks; and a variety of domestic trees near some existing parks. These attributes and the vital element of the Tuolumne River itself offer exciting possibilities for an outstanding park development.

# Tuolumne River Regional Park Plan

## Project

Revise, expand, and update 1968 plan to reflect current needs. Preserve and maintain existing and future infrastructure. Restore riparian habitat, repair riverbanks, and undertake reforestation. Expand regional recreational and interpretive educational opportunities. Acquire additional land to provide uninterrupted public open space. Establish a Tuolumne River conservancy.

## Benefits

Tuolumne River Regional Park provides an opportunity for active and passive recreation and for nature study through existing and proposed amenities including picnic areas, garden centers, sports fields, and natural water-related features. As development progresses, the environmental, economic and social benefits of the regional park will also increase.

## Costs and Funding Sources

Land acquisition is expected to cost several million dollars. Buildout costs are estimated at $17.6 million. Annual operation and maintenance costs range from about $500,000 for existing facilities to $3.5 million at buildout. Funding for environmental restoration and studies is also needed.

## Related Activities

Staff should continue liaison with the Trust for Public Land and should seek information from the State on establishing a conservancy for Tuolumne River Regional Park. Seek continued grant funding from the Federal Land and Water Conservation Fund, the Federal Intermodal Surface Transportation Enhancement Act, the State Environmental Enhancement and Mitigation Program, and other sources. In addition, a Tuolumne River Restoration Center is being developed.

## Conflicts and Resolutions

The cities of Modesto and Ceres are updating their General Plans. These plans should address the benefits and impacts of Tuolumne River Regional Park, and the goals and objectives of each city should include preservation and development of the regional park. The existing plan needs to be updated.

## Implementation

Tuolumne River Regional Park is an existing long-term project.

# Urban Runoff Management

## Storm runoff from urban areas conveys toxic material into the San Joaquin River.

### Background

Urban runoff contains toxic and harmful materials from a variety of sources. Examples are heavy metals, oils and greases, exhaust chemicals, rubber breakdown products, and yard and household chemicals. In some urban areas, these materials are directed via storm drains into San Joaquin tributaries. The result can be toxic contamination of waterways and increased risk of flooding.

### Project

Assure that new urban development is managed to retain on site any incremental runoff. Urban areas are under waste discharge requirements of the Regional Water Quality Control Board. Control of urban runoff includes reducing discharges to impervious surfaces and detention, retention, and infiltration of runoff. These measures are being implemented immediately to better use precipitation and protect surface water quality. The Regional Water Quality Control Board and other agencies responsible for water supply, water quality, and flood management need staff and funds to ensure that local grading ordinances and source control requirements are enforced.

### Benefits

After source control keeps most pollutants out of storm water, wetlands created in the detention, retention, and infiltration basins of storm drainage systems provide a way to remove remaining contaminants from urban runoff and hold back water that would add to flood peaks.

### Costs and Funding Sources

In most cases, costs for reducing pollution from urban runoff would be borne by new construction, but economic studies show the costs of better management of urban runoff are much less than the costs of treatment or the damage done to public resources. *Urban Best Management Practices*, prepared by the State Water Resources Control Board, gives approximate construction costs of such treatment systems as wet detention basins that rely on constructed wetland and riparian habitat to treat urban runoff.

Funding for management of urban runoff may be available through Environmental Protection Agency non-point source grants via the State Water Resources Control Board. Low-interest loans for water conservation projects to infiltrate storm water may be available through the DWR Water Conservation Loan program.

# Urban Runoff Management

## Related Activities

The Fresno system captures nearly all storm flow in infiltration basins, which filter out pollutants and recharge ground water used for municipal supplies. Wetlands created can supplement other areas managed for wetland wildlife.

## Conflicts and Resolutions

Developers and urban planners are accustomed to using natural watercourses as a destination for storm drainage, but this damages water quality and causes erosion and flooding downstream. If better management of storm water requires a greater proportion of presumably developable land to be devoted to natural treatment systems, property owners may complain about regulatory taking of that part of their property. Because use of detention and infiltration basins reduces threat to life and property as well as treating pollutants and still leaves an economic use of the property, an explicit and legally defensible justification can be made for using these natural systems.

## Implementation

Existing urban runoff need not be routed straight to the streams of the San Joaquin Basin forever, even though this damaging and wasteful practice will continue in the short term. New development can easily adopt best management practices as proposed. In the long term, existing urban areas should incorporate total water management plans to treat and use waste water and storm water drainage as an addition to the domestic supply system rather than disposing of it to the river.

Local land use planning must comply with CEQA requirements, but storm water management has not always been treated thoughtfully. State agencies with responsibility for water quality and flood management are already regulating storm water discharges but need to be aware of land use decisions of jurisdictions upstream and need to intervene when those decisions will aggravate flooding and water quality problems downstream. The CEQA process is one of the best avenues, short of litigation, by which jurisdictions can intercede with their neighbors.

No new legislation is required.

Every water agency has the ability to intervene with local land-use decision-makers upstream, but few are aware of or have enough staff to use the opportunity. CEQA procedural requirements for quick review and comment on documents restrict the opportunity for agencies to comment.