

THE WILDCAT-SAN PABLO CREEK FLOOD CONTROL PROJECT AND ITS IMPLICATIONS FOR THE DESIGN OF ENVIRONMENTALLY SENSITIVE FLOOD MANAGEMENT PLANS¹

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Abstract: In 1982 a coalition of neighborhood and environmental organizations used a community organizing strategy of the early 1960's, referred to as "advocacy planning" to substantially redesign a traditional structural type of joint federal and local flood control project on Wildcat and San Pablo Creeks in North Richmond, California. Using a combination of foundation and other funding, the coalition designed their own water project that would preserve and restore the riparian values of these two highly urban creeks and would not only meet the important objective of reducing flood damages but would also retain the pair of streams as an important community resource. The advocacy planning process developed into consensus planning, in which all the government agencies and parties with an interest in the project formed a design team and arrived at a very different sort of flood control project. The project provides a useful model for both project design innovations and creates a design process which can have significant influence on the salvaging of natural riparian environments.

A flood control project is currently (1988) under construction on Wildcat and San Pablo Creeks in North Richmond, California, which was designed for the complementary objectives of reducing flood damages, preserving or restoring the riparian environment, restoring brackish marshes and fresh water wetlands, environmental education, recreation, and aesthetic enhancement of the community. The set of "Standards and Principles" used by the Federal water development agencies in the 1980's to design and fund water projects have, in effect, put the federal government in the business of single objective planning. This project imposed a multiple objective planning process on a planning system designed to discourage more than one objective. Important lessons can be learned from this project's fascinating history, design process, funding strategies and design features.

The History of Project Planning

Background

No one has questioned the claim that flood reduction measures are needed on Wildcat and San Pablo Creeks. The issue has been over the proper design of the project and how best to develop funding opportunities for it. Flooding due to overflow of Wildcat and San Pablo Creeks and to poor local drainage occurs almost every year, with more severe flooding (more than a foot of water) taking place in North Richmond about once in three years (Design Memorandum, USACE 1985).

North Richmond was developed during World War II when blacks who were brought in to the shipbuilding industry were segregated into a community on the Wildcat-San Pablo floodplain. As recently as 1980, Census figures showed 64.5 percent of the households as female headed and below the poverty level.

One of the earliest reports on the need for flood control was written by the Contra Costa County Flood Control District in 1956. In consequence of this, Congress authorized a feasibility study for flood control on the two creeks in the 1960 Flood Control Act. This resulted in a 1968 report from the Army Corps of Engineers (Army Corps) on alternative flood reduction plans, but no plan was recommended then for implementation because the prevailing poverty conditions forced the total benefits (largely as property to be protected) so low that no project option could pass the federal cost benefit test.

In the meantime, a Richmond Model Cities Program had begun, and by 1971 a community based plan was developed that featured Wildcat and San Pablo Creeks and the San Pablo Bay shoreline as a recreational commercial resource to serve as a focus for the redevelopment of the area. The Model Cities Program called for the Department of Housing and Urban Development to revive flood control planning. This led HUD to contract out for a privately prepared economic analysis. The more favorable cost benefit formulas from consultants that were engaged for this study enabled the Army Corps to conduct

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a planning process reflecting the new pressures of the 1970's to increase public participation in project planning. This process yielded a new community supported flood control plan which received Congressional authorization in 1976. This plan reflected traditional structural principles of flood control planning and featured open concrete channels, closed culverts, and trapezoidal earth channels. It was unusual, even for the 1970's, in including environmental features such as fishing ponds, trails, and picnic areas.

When proponents of this project set about raising the required local share of the expense, they encountered difficulties on almost every front, not the least of which was the fact that some major beneficiaries would not agree to share in the project costs. Among them were Chevron Oil, the Southern Pacific Railroad, the Atchison, Topeka and Santa Fe Railroad (which had a train derail over San Pablo Creek in the January 1982 storm), and the Richmond Sanitary Company. This contributed to the failure of the local effort to raise the required sum for the project.

In 1982 Contra Costa County proposed a "bare bones" structural flood control project, to be constructed in cooperation with the U. S. Army Corps of Engineers, without any environmental amenities. They presented the plan on a "take it or leave it" basis, arguing that it was the only affordable alternative.

The Consensus Plan

Some North Richmond residents were resigned to accepting any flood control project offered. Others felt so strongly about the Model Cities Plan, however, that they wanted to retain some influence on the flood control design process and sought to explore a number of project options. In the spring of 1983 Ivy Lewis, a respected long time community leader, organized a meeting in North Richmond to react to the county flood control proposal. Ann Riley and Alan La Pointe, representing the Urban Creeks Council, and Phil Williams, a well known expert in hydrology, attended this meeting. The issues raised at that meeting defined the work for the next five years, as citizen volunteers sought to change not just the plan design but the planning process itself and funding strategy as well.

The North Richmond community groups, which included the Richmond Neighborhoods Coordinating Council, headed by Lillie Mae Jones, the Urban Creeks Council, the Save San Francisco Bay Association, and the Contra Costa County Shoreline Parks Committee, formed a coalition to request that a plan be developed to recognize Wildcat and San Pablo Creeks and the shore-

line as important local and regional resources. Their statement pointed to severe technical difficulties in the county plan and identified a number of regulatory and funding problems associated with it.

There were also several important environmental concerns. One was that Wildcat Creek in particular had been identified by the California Department of Fish and Game as one of the last streams in the Bay Area which still had nearly continuous riparian environment along its length. This plan would convert much of it to a concrete and earth lined channel, complete with covered box culverts. Second, a number of hydrologists and environmental experts were concerned that the project would seriously degrade the important wetlands associated with the lower flood plains by concentrating the stream systems' sediment load on that area. Third, there were no plans to provide recreational open space and the related educational benefits for the local communities. Effects on adjoining regional parks were similarly ignored in the plan.

One of the technical concerns raised by Phil Williams was that the estimates of sediment moving through the creek system were substantially too low. He also expressed the view that the concrete lined channels would not provide the flood protection assumed by the project designers because the sediment would increase the hydraulic resistance and decrease the capacity of the channels. He was concerned, too, that the plan created costly and frequent maintenance needs, and that the proposed sediment detention basin on Wildcat Creek would not protect Wildcat Marsh from sedimentation. He was supported in his views by the well known hydrologist Professor Luna Leopold of the University of California, Berkeley.

The citizen's coalition also questioned the wisdom of locating a box culvert that would be carrying high velocity storm flows next to an elementary school. They anticipated difficulties in getting regulatory approval from State and Federal agencies for the County Corps plan (which the agencies called the "Selected Plan"), and they predicted trouble in obtaining funding for such a plan, given Washington's demands for increasing the local cost sharing requirements, and given its unattractiveness to other potential Federal and State participants.

Even though a planting of native trout in Wildcat Creek sponsored by the Grizzly Peak Flyfishers, East Bay Regional Park District and the Department of Fish and Game in September of 1983 increased public awareness of these environmental issues, the County still remained opposed to broadening the project objectives or responding to technical reviews. The Urban Creeks Council and the Richmond Neighborhoods Coordinating Council decided that the best strategy was to develop their own plan, and they were successful in obtaining

Vanguard and San Francisco Foundation funding to do so. Mary Jefferds, on the Board of Directors of the East Bay Regional Park District, was an early supporter of such a planning effort because she saw an opportunity in it to extend popular regional trails by linking Wildcat Canyon and the Point Pinole Shoreline Park through the Wildcat and San Pablo Creek flood management project and the marshes.

Additional financial assistance from Save the San Francisco Bay Association and the Regional Park District brought the final alternative planning budget to \$50,000. With Phil Williams' assistance on the hydraulics, a "Modified Plan" based on a very different design philosophy was developed. The approach was to modify the existing creek channels to simulate the natural hydraulic shape of undisturbed streams, thereby continuing some of the normal fluvial processes. This would cause sediment to be deposited on the upstream floodplain and restore valuable riparian vegetation. The proposed concrete and trapezoidal dirt channels would be replaced in this plan by more natural low flow channels that would be bordered by flood plains and have set back levees, planted gabion walls, and riparian trees. Thus, regional trails and park facilities would become possible.

The citizen planners developed their own project cost estimates and funding plan and presented their "modified plan" at all the same meetings attended by the public and government agencies in which the "selected plan" was presented. Assembly Member Bob Campbell's staff lead in the search to identify new funding sources which would be made possible by the broader objectives of the modified plan. Through negotiation with the County they also helped develop a planning process to arrive at some sort of consensus plan. This included County appointed design and funding teams.

On February 19, 1985 the Contra Costa County Board of Supervisors approved the "selected plan" for construction but left the door open for the modified plan, conditioned upon the availability of funds.

Two outside opinions then swung the balance toward compromise. In June 1985, a legally required biological opinion from the U.S. Fish and Wildlife Service (US-FWS) called attention to impacts of the "selected plan" on the marshes and their endangered species. Their opinion identified the modified plan as "the prudent and reasonable alternative."

The second blow to the selected plan came from the San Francisco Bay Conservation and Development Commission (BCDC) which found that plan inconsistent with the BCDC Bay Plan (McAteer Petris Act). The BCDC opinion found the modified Wildcat San Pablo plan to conform to the Bay Plan.

This series of events set the stage for the eventual development of a consensus plan for which the modified plan provided the major components. Construction began under this consensus plan in 1987 and continues today.

Contributions to the Flood Control Project Design Process

The Consensus Design Approach

The establishment of a project design team by the County Board of Supervisors has represented a unique contribution to federal flood control project planning. The team consisted of representatives from the U. S. Fish and Wildlife Service, the California State Lands Commission, the California Department of Fish and Game, the San Francisco Bay Conservation and Development Commission, the California Coastal Conservancy, the East Bay Regional Park District, Assembly Member Bob Campbell's office, State Senator Dan Boatwright's office, Congressman George Miller's office, the coalition of citizen groups, local land and nursery owners and, of course, the Contra Costa County Flood Control District and the U. S. Army Corps of Engineers.

It is important to recognize that this team was formed for the entirely practical purpose of coordinating and integrating the concerns of the regulatory agencies and the public. It would be incorrect to say that the County acted out of an enlightened intent to pioneer consensus planning. The design team was formed under crisis conditions caused by the lack of support for a traditional type of project and by the bad publicity that the proposed County Army Corps project had generated.

The team was charged with producing a fundable project that the regulatory agencies would accept and which the public groups could endorse. Meetings were held no less than once a month. In 1985 this sometimes meant as often as once a week. Throughout the five year planning effort the attendance at design meetings remained high, averaging approximately 20 a meeting.

Power blocks formed and the different interests on the team competed vigorously. Many of the meetings could only be described as grueling. An important turning point in the consensus making process came when a neutral person, who happened also to have good group management skills, was appointed to chair the team. This was James Cutler of the County Planning Department.

In this way a project was designed, funded and constructed in only three years—this after an unsuccessful 25 year planning history. One notable problem occurred when relevant interested parties were not included on the

design team. Specifically, the Richmond Unified School District was not adequately involved in designing the part of the project which ran through their property near an elementary school. The School District held up the project by withholding the project's right of way until its concerns were met. The District also used the advocacy planning strategy, hiring their own consultant to design an alternative.

Another major problem developed when continuity in decision making and plan formulation broke down because personnel were constantly changing at the Army Corps and the County Flood Control District. One result was that construction plans which did not reflect the consensus of the design team were given to the contractors and a half mile of riparian vegetation that was to be preserved ended up being bulldozed.

Shortly thereafter, a levee was put in the wrong location. This blocked a plan to restore a marsh and jeopardized State funds for the part of the plan involving wetland enhancement. Assembly Member Campbell's office helped tighten the planning process, and the Design Team then made certain that minutes were adopted in public sessions and approved stream project cross sections and maps were published.

Project Design Features

One of the most important features of the citizen's "modified plan" was that the stream corridor or floodway was designed to remain within the same narrow right of way boundaries as the County Army Corps' plan, while providing the same level of protection from a 100 year flood event. The modified plan, however, provided for a channel geometry based on natural floodplain features in place of the standardized trapezoidal and rectangular channels and box culverts. It is commonly assumed that a strict geometric channel must be constructed if channel width must be limited. The new channel design called for a meandering low flow channel 10 to 15 feet wide, designed to carry what hydrologists call the 1.5 year recurrence interval flow. This is a "flood" that is barely any higher than the highest flow in the most ordinary of years. In the modified plan the low flow channel was to be bordered, in one reach, by a floodplain terrace where higher flows could spread, lose velocity and deposit sediment. Riparian vegetation would be included on both sides of the low flow channel. This design provides for trapping as much sediment in the upstream floodplain terrace as possible to keep downstream marsh areas from filling in. The plan also called for widening the slough channel through Wildcat Creek marsh at the mouth of the stream and excavating sediment there. This would increase the brackish marsh area and restore tidal action in the marsh.

As the consensus plan developed, the design team was able to provide a wider channel than either earlier plan called for because of the addition of lands to the project by two other entities. The State Lands Commission purchased some downstream land on Wildcat Creek to provide a transition zone between the riparian corridor and the bayshore marsh. This was designed to serve also as a sediment catchment area. Upstream on Wildcat Creek the School District donated additional land for the right of way when it discovered the land would provide them with more design options.

While the consensus plan is unquestionably a compromise between two design philosophies, the basic components of the modified plan were preserved in it. Features were retained largely because of the importance of managing the large amount of sediment, particularly in the Wildcat watershed, in order to avoid degrading the habitat of endangered species in the marshes.

The Waterways Experiment Station in Vicksburg Mississippi which was assigned the task of reviewing the project design required a change in location of an upstream sediment catchment basin before the Office of the Chief of Engineers would approve the design. This change ultimately raised the land acquisition costs for the project.

Funding History

The fact that this project made a transition from a single objective project that was concerned with flood control alone to a multiple objective project that would create a riparian corridor in the midst of the city, restore marshes, provide recreational, and educational opportunities and enhance the environment of a largely impoverished urbanized area made it possible to attract funding from State agencies that could not have been approached before. As a result, the East Bay Regional Park District committed \$793,000 for a regional trail system which was then matched by another \$793,000 by the Army Corps. The Park District later committed \$19,000 to help enhance creekside educational opportunities near Verde School. The District may possibly commit more as the recreation and educational project element is finalized.

In addition, the California State Lands Commission purchased \$240,000 of lands for the Wildcat Creek wetland transition zone, mentioned above. In February of 1987 the California Coastal Conservancy Board improved prospects for both the wetland and riparian aspects of the plan by authorizing an expenditure of \$578,000 for marsh restoration and riparian enhancement. After the original restoration plan was upset by the construction mistakes in the Wildcat and San Pablo

Creek marshes and after the County was unable to identify willing sellers of riparian land parcels, the Coastal Conservancy headed a task force to come up with a new marsh restoration Plan. A total of \$46,200 was used from the first Coastal Conservancy authorization, with \$5000 going to the design team effort. The Conservancy Board then authorized an additional \$314,870 to implement a revised restoration plan.

As of the fall of 1988, the consensus plan has attracted non flood control funds totalling at least \$1,905,000. Various contingencies could raise that to \$2,428,000. The design team's finance committee is not finished with its fund raising activities, however, and there are reasonable chances of more State or Park District monies becoming available.

The federal project cost sharing policies in the 1980s have stressed increasing the non federal contributions for projects and using both the ability and the willingness to pay as criteria for approving projects. Their policies have historically made it extremely difficult for a poverty community to meet the costs associated with a large project in this case \$30 million. The strategy that this community found best to use in raising its non-federal share was to diversify the project and attract State dollars for these added benefits. This created a "Catch 22" situation, however. These new aspects of the project added to total project costs, which, under current federal policy, raised that side of the cost-benefit ratio. The prospect was that whatever money might be contributed for these new project elements would have no effect on financing the flood control project, leaving project approval just as far out of reach as ever. The Army Corps' project manager worked around this impasse by classifying the marsh restoration, riparian areas, wetland transition zone, etc. as enhancements occurring outside the project boundaries and therefore not part of the official project costs.

Thus, it turned out that there were ways around the bias that exists in evaluation and funding policies for federal projects, but it seems likely that few of the many disadvantaged minority communities that, by societal default, have grown up on some of the most severely flood threatened lands will be able to follow this route. The cost sharing requirements make it a local responsibility to purchase lands, easements and rights of way. This builds in a bias against the purchase of riparian preservation zones, trails and other environmental features in communities like North Richmond.

Technical Issues Reviewed

One controversial technical issue was that of estimating the sediment loads that would be carried by the creek. Philip Williams argued that the natural creek

channel could be expected to carry higher sediment loads than the Army Corps had figured and predicted that the bed would accumulate deposits, reducing channel capacity. Widening the channel, which was the Corps' response, would further increase deposition, in Williams' view. He designed the project in the modified plan, with its narrow low flow channel and flood terraces to better transport sediment in suspension at higher velocities.

Philip Williams and the distinguished hydrologist Luna Leopold both questioned the ability of the proposed sediment basin to perform as a trap. Later, specialists at the Waterways Experiment Station of the Army Corps of Engineers independently expressed the same concern. A newly located basin further upstream, the higher velocity low flow channel, the floodway terrace and the wetland transition zone at the mouth all became features of the consensus plan for Wildcat Creek, with the aims of limiting deposition in the marsh and on the stream bed.

An additional design issue grew out of the requirement to mitigate for the loss of twenty four acres of riparian vegetation. The original 1982 proposal called for planting trees on some acreage located north of Wildcat Creek. The consensus plan integrated that wooded acreage into the project corridor, placing it along the low flow channel to help the stream form and maintain that channel and provide shade to help control of the growth of rushes, reeds and aquatic plants. These are seen as clogging the channel and inducing sedimentation. County Engineers did not want vegetation near the channel because they felt this would make maintenance difficult for them.

Another difficult issue was the assignment of "roughness" values for the Manning Equation to portions of the floodway containing vegetation. This affects decisions on how wide a channel must be built and how much vegetation must be cleared during maintenance operations. The choice of values is partly subjective. Thus, the Army Corps originally considered using a value of 0.100 for the riparian areas next to the low flow channel and 0.045 for the north flood terrace. Negotiation in design team meetings finally yielded an agreement to use a composite value for the low flow channel and south bank riparian forest of 0.050, conditioned upon keeping the low flow channel clear. A .035 value was assigned for the north bank flood terraces, which would be maintained in low shrubs and grasses.

Agreement then hinged upon the development of a consensus regarding a maintenance plan to keep the low flow channel cleared of vegetation until a riparian canopy could grow. This canopy would then be expected to shade out the unwanted vegetation which will fill much of the exposed low flow channel. The agreement was negotiated in this case between the County Supervisor

and the Project Manager for the Army Corps of Engineers and was based upon using inexpensive hand labor provided by conservation crews. The potential crews include the State's Conservation Corps and a local East Bay Conservation Corps, as well as possible assistance from the State's new "workfare" program. It was also agreed that annual maintenance routines would be replaced by a program based on actual need. Maintenance activities, costs and impacts will be reduced by acting only to assure that specific channel capacities can be maintained.

Finally, in a move to make certain that the revegetation effort restore a riparian environment along the low flow channel, as recommended by both USFWS and the State Lands Commission, rather than simply landscape a flood control project, the County requested that the U. S. Soil Conservation Service (SCS) provide a land-

scape architect with experience in revegetating streams. They did so, under contract with the Army Corps, loaning Robert Snieckus to the project. He will be using root wads and cuttings from plants on or near the site, together with seeds and container stock of species native to the locale. Specifications are provided in a September 1988 supplement to the Corps' design memorandum. Recognizing the competence of landscape architects in this role, the design team has requested that the Corps continue the SCS staff to do the planting.

The test of this innovative project will of course be in the product, with the questions being, first, will final construction meet the design team's specifications and, ultimately, will the flooding problems in North Richmond be significantly reduced?