

**RESPONSE TO PUBLIC COMMENTS  
DRAFT BUTTE CREEK FLOODPLAIN MANAGEMENT PLAN  
NOVEMBER 2005**

An administrative draft of the Butte Creek Watershed Floodplain Management Plan (FMP) was reviewed by the Steering Committee and comments and suggestions that were received were incorporated into the FMP to produce the public review draft FMP (November 2005). This public review draft FMP was posted on the Butte Creek Watershed Conservancy (BCWC) Website between December 20, 2004 and February 22, 2005, which was designated as the 60-day public review period. Hard copies and electronic copies (on CD) were provided to all those who requested a copy to facilitate their review. The draft FMP was also presented to the County Board of Supervisors during its meeting on January 25, 2005, which was open to the public. The process for review of the draft FMP was a continuation of the extensive public involvement that was central to this project as discussed in Section 2.0 and Appendix D of the final FMP.

The public review comments received after the public review period were diverse in nature. All members of the public who submitted comments on the draft FMP were invited to a meeting on March 17, 2005, at the City of Chico to provide an opportunity to discuss their comments prior to finalization of the FMP. This meeting was attended by Butte County staff (Public Works Department and Office of Emergency Services), BCWC representatives, the consultant's team, and two members of the public who submitted comments.

To most effectively address the issues that were discussed in the comments, the comments were categorized into key issues. The respective issues and the entity or person commenting is presented in Table 1. The discussion that follows Table 1 responds to the respective issues as they relate to the Butte Creek Watershed FMP and how these issues were addressed in the final document. These comments from the public proved useful in producing the final FMP.

**NEW DEVELOPMENT AND BRIDGE REPLACEMENT SHOULD BE INCORPORATED INTO HYDRAULIC ANALYSES**

Section 4.0 in the draft Plan, General Mitigation Measures in the final FMP provide a recommendation to incorporate future conditions hydraulic and hydrologic modeling in the development or update of the General Plan and area plans to ensure that runoff and flow rates are based upon future conditions.

A detailed discussion of the conveyance capacity of several bridges of concern is included in Section 4.0; Section 6.0, Action Item E; and Appendix G. Action Item D in the final FMP addresses new development in terms of updating storm drainage design criteria and storm drainage master plans consistent with general plans so that infrastructure can be identified and implemented to mitigate adverse impacts of new development on storm drainage.

Action I in the final FMP provides guidance on implementing, monitoring, evaluating, and updating the FMP based upon new data and information.



## **LAND USE/GROWTH IMPACTS**

Section 4.0 in the draft Plan, General Mitigation Measures, Butte County and Incorporated Cities General Plan/Area Plan Update, provides a recommendation to further enhance planning efforts by incorporating future conditions hydraulic and hydrologic modeling in the development or update of General Plan and area plans. The final FMP addresses this in an action plan, Action Item G, in Section 6.0.

Local drainage, as it pertains to increasing flooding, is addressed in the draft FMP in Section 3.0 “Risk Assessment, Local Drainage,” and in Section 4.0 “Mitigation Measures, General Mitigation Measures, Local Drainage.” This issue is also addressed in the final FMP in Section 3.0, Local Drainage Flooding.

Action Item G, Land Use Planning, addresses the importance of land use policies being implemented to not increase the risk of flooding over time. Particular attention is given to restricting development in areas protected by levees.

## **INCLUDE CALCULATION SHEETS**

Appendix F of the final FMP contains the calculation sheets and methods and results for hydraulic and hydrologic studies conducted for the FMP and the basis for construction costs as well.

## **SETBACK LEVEES AND FLOODPLAIN EXCAVATION AS A MITIGATION MEASURE**

The magnitude of the flood hazard problems within the Butte Creek system and the provisions required dictate the nature of the solutions provided in the draft FMP. For example, if the Butte Creek levee system only provided protection for a 10-year event, to acquire 100-year protection or better, a major transformation of the system would be necessary. Currently, the Butte Creek levee system, as demonstrated in the January 1997, contained more than the 100-year flow without adequate freeboard. A major transformation of the entire system would be costly and hard to justify from a benefit/cost standpoint, given the limited number of damages in comparison. The 1997 event, which has been determined to be greater than the 100-year event flow within the reach between Highway 99 and Midway Road as listed in the FEMA Flood Insurance Study (FIS), did not overtop the Butte Creek levees.

The existing Butte Creek flood control project has setback levees from the south end of the levees extending to approximately 2.3 miles upstream of the Southern Pacific Railroad crossing. The levee setback distances on both sides of the channel vary between 200 feet to 2,000 feet. The existing setback levees in the Butte Creek system provide land for ecosystem and riparian habitat restoration that would extend naturally to connect to with the Butte sink area. Terracing the bench between the creek and setback levees was

evaluated; however, the benefits in terms of increasing freeboard are small and the costs are significant (Appendix F).

A preliminary cost estimate for rehabilitating and raising the existing levees was estimated at approximately \$22 million, as noted in the Hydraulic and Hydrologic Analyses provided in Appendix F. The cost for increasing the setback distance would be more costly. This cost estimate does not include any environmental compliance and permitting costs or the cost for land acquisition that would be needed for increasing the distance between the existing setback levees. A complete rehabilitation of the existing levees would not be feasible at this time. If the existing levees are found to be structurally sound based on geotechnical evaluation, a project to only raise the levees would be more feasible.

### **LACK OF PUBLIC INVOLVEMENT AND PUBLIC INPUT IN THE DRAFT FMP DEVELOPMENT PROCESS**

Section 2.0 of the final FMP includes a detailed discussion of the extensive public involvement process. Appendix D includes a listing of all the public meeting invitations, the database with the mailing recipients, the elementary school presentations, and public meeting agendas, notes, and attendance sheets.

### **JUSTIFICATION FOR THE COST OF THE LEVEE MITIGATION FOR THE ENTIRE BUTTE CREEK SYSTEM**

The cost of over \$22 million provided in the draft FMP to raise and certify the entire levee system was provided on the assumption that a geotechnical analysis would show that major work is required on the entire levee system. There is no basis for assuming otherwise at this time. The costs of private damages reported to FEMA in Butte County since 1978 through 2004, is approximately \$3 million. Projects to repair damage done from the 1995 and 1997 flood events, as reported by the Natural Resource Conservation Service (NRCS) and Butte County Damage Survey Reports conducted after the events, amounted to approximately \$1.4 million. According to the Federal Emergency Management Agency (FEMA), each year Butte County residents pay almost \$1 million in flood insurance premiums. Although the sum of these costs is significant, they still would not justify the high cost of raising and certifying the levees as provided by the cost estimate provided in the Draft Plan.

The intent of this evaluation was to provide a contrast between the cost of a major overhaul of the levee system on Butte Creek and historic losses over the past 25 years. That said, following the FEMA guidelines for estimating losses, the total value of the structures and contents at risk in the event the levee system on Butte Creek fails and causes a flood of two feet of inundation was approximately \$190 million.

On the other hand, from the standpoint of actual damages witnessed and reducing or eliminating flood hazard insurance premiums, the reconstruction of the levees would not

be feasible. Again, if it is determined that the levees are sound from a structural standpoint, raising the levees may be feasible.

## **NOT MEETING THE FIRST OBJECTIVE**

The established goal and objectives of the Draft FMP are to:

*Goal:* Minimize environmental impacts of required flood management.

*Objective 1:* Utilize relevant information to develop flood protection measures that protect life and property and enhance fish and wildlife habitat.

*Objective 2:* Support improved performance and coordination among and within agencies responsible for providing flood protection, post-flood restoration, and protection of habitat.

*Objective 3:* Support the development of pre-flood emergency response management.

*Objective 4:* Establish criteria for development within the floodplain, which will not adversely impact the flood plain, flood flow capacity, or neighboring properties.

*Objective 5:* Develop the document so as to comply with the Disaster Mitigation Act (DMA) 2000, Local Hazard Mitigation Plan.

The goal and objectives were derived from the Butte Creek Watershed Management Strategy, are included as part of the CALFED proposal, and reviewed at every public meeting held as part of this project. The intent of the goal is to provide guidance to minimize the loss of life and property from flooding within the Butte Creek watershed and ensure that any proposed mitigation measures to address the flooding hazards do not adversely affect fish and wildlife within the watershed and to the maximum extent possible enhance environmental resources.

Many project efforts, initiated and implemented by the Butte Creek Watershed Conservancy, The Nature Conservancy, Ducks Unlimited, Inc., the California Waterfowl Association, as well as private landowners, local water districts, reclamation districts, and federal and state resources agencies, have focused on fish passage and improving riparian habitat in the entire Butte Creek system for over 10 years (California Department of Fish and Game (DFG), 2003). Expenditures on restoration projects and efforts on Butte Creek have exceeded \$33 million since 1993. These activities have paid tremendous dividend in terms of the recovery of the spring-run Chinook.

## **AFFECT OF LEVEE CERTIFICATION ON HABITAT**

The potential environmental impacts of raising the levees as a method to ensure levee certification is considered limited. Keeping in mind that the Butte Creek floodplain as reflected on the FEMA FIRMs represents hypothetical levee failure, and the fact that the existing system handled 37,500 cfs, it is clear that raising the levees would not lead to a significant change in the velocity or water surface elevation in the Butte Creek system during the 100-year event. The Draft FMP is intended to propose feasible mitigation solutions and suggest that all elements, including environmental concerns, and a detailed benefit/cost assessment should be closely examined if any of these mitigation projects are to be implemented.

## **INADEQUATE DISCUSSION OF LANDSLIDES AND BANK EROSION**

Previous high precipitation events in the watershed have led to significant runoff, which in turn led to hillside and channel erosion. This concern was brought up during public meetings about the effect of debris loading on bridge structures and their conveyance capacities. As a result, hydraulic analyses were performed to evaluate the conveyance capacities of a number of bridges of concern on Butte Creek, proposed preliminary design and cost estimates for replacement of these bridges and installation of debris control and deflecting measures. Appendix G includes details related to bridge analyses.

## **THE ENVIRONMENTAL AFFECT OF REDUCING FLOW IN LITTLE CHICO CREEK TO 100 CFS UNTIL THE LITTLE CHICO CREEK REACHES DEAD HORSE SLOUGH**

The proposal for the reduction of flow to Little Chico Creek for the reach between the Little Chico Creek-Butte Creek diversion to Dead Horse Slough to 100 cfs was intended to provide a scenario to illustrate the limited conveyance capacity of Little Chico Creek, and that with only a 100-cfs flowing in the creek downstream of the diversion structure, enough flow from Dead Horse Slough and local drainage from the City of Chico urban area would be added in the 100-year event to reach the capacity of the Little Chico Creek channel. This mitigation measure was not a recommendation and is better clarified in the final FMP in the mitigation measures section.

## **ESTIMATE OF THE 500-YEAR STORM EVENT IN 1997**

The 1997 event, with estimated peak flows of 37,500 cfs at Butte Creek near Durham Station (USGS, DWR, 2004) was higher than the 100-year event flow but did not reach the 500-year event flow listed in the FEMA FIS. More detailed discussion about this is included in Section 3.0 and Table 3-1.

## **MORE FOCUS ON LITTLE CHICO CREEK**

To propose mitigation for the entire Butte Creek system, flow in the Little Chico Creek, which passes through a highly urbanized area with the highest population density in the watershed, had to be assessed as to how it relates to flow in Butte Creek at the Little Chico Creek-Butte Creek diversion. Mitigation for Butte Creek must take into account the flow in Little Chico Creek to provide better assessment of what may happen in the system during a 100-year event. If more flow is diverted from Little Chico Creek into Butte Creek, the Butte Creek system must be able to withstand the added flow, and not significantly affect the landowners downstream of the diversion. Levee certification is affected by the limited capacity of the Little Chico Creek channel in a 100-year event.

**Ecological Reserves**  
**Bidwell Environmental Institute**  
California State University, Chico  
Chico, California 95929-0215  
Phone: 530-898-5010  
Fax: 530-898-4363



February 8, 2005

William Johnson  
Butte Creek watershed Conservancy  
Po Box 1611  
Chico, CA 95927



Dear Will:

Thank you for providing me with the Draft Butte Creek Watershed Floodplain Management Plan recently prepared by Wood Rogers Consultants. The Plan has been very helpful to me in developing watershed goals for Little Chico Creek. We recently used the Plan in submitting a funding proposal to increase the channel capacity in the urban zone of Little Chico Creek. The Plan gave me the data necessary to support removing non-native plants that currently constrict channel capacity and flow.

Thank you for sharing this important document and I look forward to reviewing the final plan.

Sincerely,

Jeff Mott, Coordinator  
Little Chico Creek Watershed Group

**Date: 02/22/2005**

**Fax transmittal to:**

Mike Radaideh  
Wood Rodgers Inc.  
Fax #: (916) 341-7767

**From:**

William Johnson  
Butte Creek Watershed Conservancy  
(530) 893-5399

**Subject:**  
Floodplain Management Plan for the Butte Creek Watershed  
Comments received from DWR on draft document.

**Comments:**  
Received US Postal service February 11<sup>th</sup>, post-marked February 10<sup>th</sup>, retrieved from PO Box on February 22<sup>nd</sup>.  
I expect several more sets of comments from other groups and individuals today.

William Johnson  
Watershed Coordinator  
Butte Creek Watershed Conservancy  
PO Box 1611  
Chico Ca 95927  
(530) 893-5399

**DEPARTMENT OF WATER RESOURCES**

NORTHERN DISTRICT  
2440 MAIN STREET  
RED BLUFF, CA 96080-2356



February 10, 2005

Mr. William Johnson, Watershed Coordinator  
Butte Creek Watershed Conservancy  
Post Office Box 1611  
Chico, California 95927

Dear Mr. Johnson:

This letter summarizes both general and specific comments on the December 2004 draft of the Butte Creek Watershed Floodplain Management Plan. Comments on the flood hazard area proposals are limited in scope since the calculation sheets in Appendix G were not available. The general comments are as follows:

- The plan should address further coordination between Butte County and the City of Chico regarding current and future growth impacts on floodplain management activities and cumulative runoff affects throughout the entire Butte Creek watershed.
- Provide additional information for each of the Flood Hazard Areas (FHA) and associated proposals (i.e., more detailed maps, existing conditions, project descriptions). The dismissal of proposed project alternatives should be defensible and include a magnitude of cost if deemed unfeasible
- Minimize the redundancy between sub-sections of the plan.
- Edit the report to remove run-on sentences, clarify thoughts, and ease readability for all users.

Specific comments are provided below and relate to the document by page, paragraphs, table, figure or map number (the number begins with the first complete paragraph on each page unless otherwise indicated):

- Page 1-1, par. 4. Butte Creek enters the Sacramento River either through the Butte Slough Outfall or via Sacramento Slough, Sutter Bypass and Butte Slough depending on operations and river levels at the Outfall.
- Page 1-1, par. 5. Little Chico Creek flows through the City of Chico and parallels Big Chico Creek to the north and the Sacramento River to the west. Flows in Little Chico Creek can return to Butte Creek via Angel Slough or contribute to the Butte Basin Overflow Area component of the Sacramento River Flood Control Project.
- Page 1-3, par. 4 (Butte Creek Watershed Overview). The plan should clearly state that the Butte Creek Watershed covers portions of three counties (i.e. Butte, Colusa, Glenn). However, the will only cover the Butte County portion of the watershed.

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- Page 1-4, par. 3. The Butte Slough Outfall Gates can either release Butte Creek and Butte Basin flood waters into the Sacramento River or redirect the flow into the Sutter Bypass for discharge to the river at Sacramento Slough. The Butte Basin Overflow Area, Butte Slough and the Sutter Bypass become inundated during flood events.
- Page 1-4, par. 4. Moulton Weir should be included with other flood relief structures on the Sacramento River. These structures all contribute flood waters at various locations to the Butte Basin Overflow Area component of the Sacramento River Flood Control Project.
- Page 1-5, pars. 1 through 8 (Waterways that Affect Flow in Butte Creek). The waterways should be grouped according to those flowing directly into Butte Creek and those flowing into Cherokee Canal. Cherokee Canal is a levied, flood control project that joins Butte Creek in the Butte Sink. Richvale Canal is an irrigation canal and should not be considered a flood control feature. The Main Canal needs clarification as to what it is and where it is located (is this the Sutter-Butte Canal which conveys irrigation water from Thermalito Afterbay?). The Biggs-West Gridley Main Drain (833 Drain) drains the area to the southwest of Thermalito Afterbay which is bounded to the north by Cherokee Canal and enters Cherokee Canal just above Sanborn Slough. Comanche Creek conveys irrigation water and may also receive storm water contributions from the Chico area (provide further clarification). Colusa Weir should be included as an integral component of the Sacramento River Flood Control Project.
- Page 1-6, par. 2. This paragraph states that the Federal Emergency Management Agency's (FEMA) audit of Butte County confirmed compliance with National Flood Insurance Program (NFIP) regulations. For clarification, FEMA's audits use a random sampling of structures located in Special Flood Hazard Areas (SFHA) to assess a community's compliance with NFIP guidelines. Staff performing these assessments will vary with each audit. The 2003 audit sampled structures only in the Oroville and Palermo areas of the county and did not address significant development in other portions of the county including the areas north and south of the City of Chico. Though no compliance issues were found in this audit, it's imperative that the communities responsible for floodplain management diligently enforce all aspects of its floodplain ordinance to protect life and property.
- Page 2-1, bullet 5. An explanation of how the 1600 residents, businesses, organizations, etc. were determined should be provided.

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- Page 2-5, par. 1. The second sentence should be modified to say "...FMP establishes eligibility for funding..."
- Page 3-3, bullet 1 (FHA #1). How was the 500-year event in 1997 determined? What gaged flow was compared with the Flood Insurance Study (FIS)? What is the confidence level of the FIS' 500-year flow? The paragraph should be written to say "The levees along both banks of Butte Creek between Midway Road to the end of the levees, which were constructed in the 1950's by the United States Army Corps of Engineers, lack adequate freeboard for a 100-year event as determined by FEMA. This lack of freeboard results in uncertified levees, which causes additional areas outside the levied system to be included in the SFHA. Although the 500-year event in 1997 as determined from the 1998 Butte County FIS did not overtop the levees, it still does not meet FEMA requirements for freeboard and cannot be certified." Map 28 should be referenced to show the extent of levees.
- Page 3-3, bullet 2 (FHA #2). The paragraph should be re-written with shorter, clearer sentences. A reference to the levees as shown in Map 28 would be helpful.
- Page 3-3, bullet 3 (FHA #3). FEMA's repetitive loss definition says "two or more flood insurance claims within 10 years." The reference to "many" buildings having elevation certificates with lowest floor elevations at or one foot above base flood elevation (BFE) is too ambiguous. Since the elevation certificates were reviewed, can the number of structures at one foot above BFE, at BFE, below BFE or unknown be quantified and related to the total number of building that are located in the SFHA?
- Page 3-4, top of page (FHA #4). Map 4 shows FHA #4 extending only to Jones Avenue not Aguas Frias Road as written in FHA #1.
- Page 3-4, bullet 1 (FHA #5). The third sentence discusses planned development by the City of Chico in the SFHA. The term SFHA should be used instead of floodplain and flood hazard area. The portion of the SFHA that is slated for development is directly related to the uncertified levee along the Little Chico Creek Diversion channel. The plan should address the need for certifying levees prior to development instead of filing Letter of Map Revisions (LOMR). The placement of fill in the floodplain should also be addressed.
- Page 3-4, bullet 2 (FHA #6). It would be helpful to relate flood flows and existing capacities to specific channel reaches or points to reduce confusion. A more detailed map than Map 4 would be helpful.

- Page 3-4, last par. The storm sewer terminology should be changed to stormwater drains unless the stormwater drains are connect into the City's sewer system. The fourth sentence should be reworded to say "Older stormwater systems were typically designed to convey the 10-year storm or less may become inadequate as additional watershed development and associated runoff increases." Drain blockage from debris is a real issue. Does the City or County have a debris inspection/clearing program and do they have public outreach regarding debris notification?
- Page 3-5, par 3. The first sentence should be reworded to say "... the vulnerability to flooding is due to increased runoff and sediment deposition in stream channels though the loss of vegetative cover."
- Page 3-7, last par. Stony Creek spelling should be checked.
- Page 3-18, par. 1. The repetitive loss property definition should be changed to reflect "within any 10 year period since 1978."
- Page 4-2, last par. See previous comments for FHA #1.
- Page 4-3, par. 2 & 3. These paragraphs should be combined and rewritten with further clarification.
- Page 4-3, par. 5 (FHA #2). Incorporate previous comments on FHA #1 and #2. Records from the Butte Creek near Chico stream gage, which is above the Little Chico Creek Diversion, indicated the peak flow in 1997 was 36,500 cfs. It is important to note that the period before and after the peak flow where estimated and the slope-area method was used to determine the peak flow. FEMA's 1998 Butte County FIS indicates 34,000 cfs for the 500-year flood at the Skyway. Thus, the 1997 flood exceed the 500-year storm event as defined in the FIS. Does this raise any concern that the FIS' 100- and 500-year flood estimates need revision for protecting life and property?
- Page 4-4, par. 1 & 2. A map of this proposal would be helpful. Appendix G calculation sheets where not provided with this draft report.
- Page 4-4, par. 4 (FHA #3). Can "many" be quantified?
- Page 4-5, par. 1 (FHA #4). FHA #4 extends only to Jones Avenue, not Aguas Frias Road.

- Page 4-5, par. 3 & 4. Conflicting statements are made regarding the 3-foot of freeboard. Paragraph 3 states that a review of the FIS' hydraulic model indicates adequate freeboard ( $\geq 3$  feet). In paragraph 4 the analysis indicates nearly the entire reach needs improvements to meet the 3-foot of freeboard requirement. The City of Chico's development in the floodplain is a concern. Requiring a LOMR is an important step, but other development could have cumulative impacts without addressing the real issue of the levee certification. It is important for a Floodplain Management Plan (FMP) to address the issue of cumulative impacts on development in SFHA and runoff associated with these developments.
- Page 4-6, par. 1. Is the hydraulic analysis based on the model used for the FIS? Appendix G calculations were not included with this draft copy to determine this. What modeling input and channel reach data were used to determine the 1,800 cfs capacity? A larger map of this area is needed to indicate reaches with specific capacity limitations and for reference in discussing proposed projects.
- Page 4-6, par. 4. The first two sentences should be revised as follows: "An existing conditions analysis evaluated the current storage volume within the Teichert pond area and the potential alternatives for reconfiguration of the pond to maximize downstream flood control benefits along Little Chico Creek. Based on site evaluations, the existing storage within Teichert Pond could reduce the maximum peak flow in Little Chico Creek by approximately 300 to 500 cfs." Is this reduction based on HEC-1 model from the FIS? Appendix G was not available to confirm this.
- Page 4-7, par. 1, 2 & 3. Re-write to improve readability and clarity. What level of analysis should be discussed here versus Appendix G? This needs to be consistent for all proposals.
- Page 4-7, par. 4 & 5. How realistic is vegetation clearing and to what extent should it occur? A map or table would be helpful to define the routing and flows. How does Deadhorse Slough and local drainage flow relate to the FIS?
- Page 4-8, par. 1. It is stated that the Little Chico Creek Diversion channel has adequate freeboard, but the levees are not certified. This conflicts with statements on Page 4-5, paragraph 4.
- Page 4-9, last par. An example of this is the City of Redding's future build-out planning in their floodplain modeling and mapping. This example should be reviewed and considered for a proposed planning option.

Mr. William Johnson, Watershed Coordinator  
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- Page 4-10, last par. Incorporating reasonably anticipated water depth and flow in to the design and construction of new and existing bridges should be done in compliance with NFIP guidelines and incorporate appropriate levels of hydrologic and hydraulic modeling.
- Page 4-13, table 4-1. There are duplicate station listings. The attached copy of this table indicates some edits (further review is needed). This table should distinguish between historical data and the availability of records through the California Data Exchange Center (CDEC) or other websites. Acronyms should be used for agencies to reduce the length of the table.
- Page 4-19, last par. The routine 5-year FEMA audit is a random sampling of structures to evaluate a community's compliance with the NFIP and its Floodplain Management Ordinance. Audit quality is dependent on the random sampling of structures and flood zones throughout a community. With the 2003 audit's sampling limited to the Oroville and Palermo areas, the Butte Creek Watershed was not comprehensively evaluated. To better understand the development of a community's floodplain management program, the last three audits should be reviewed to determine what compliance issues may have occurred and how the community responded in resolving them. Also include information for the City of Chico.
- 4-20, par. 1. Has the California Department of Water Resources (DWR) Sutter Maintenance Yard agreed to the concept of preparing a comprehensive patrol schedule and coordinating it with the Flood ALERT Network?
- Page 4-21, Figure 4-1. The footnotes are not listed.
- Page 4-27, par. 2. If California State University, Chico's Geographic Information Center (CSUC GIC) is posting the FEMA Flood Insurance Rate Maps (FIRM), it should still be the responsibility of the community's floodplain administrator to ensure the correctness of the website information.
- Page 4-29, Table 4-6. The DWR is not a regulatory agency as listed for Flood Hazard Data/Maps and Prevention. The Reclamation Board maintains the regulatory floodway maps.
- Page 8-1 & 8-2. The overview for FHA #1 and FHA #2 should incorporate the comments outlined above for these areas.

- Page 8-3, par. 1. The last sentence is incorrect. Not all structures located within the SFHA are elevated to the current county code of 1-foot above base flood elevation (BFE) because they may either be Pre-FIRM or meet previous Floodplain Management Ordinance regulations.
- Page 8-3, par. 3. Aguas Frias Road should be changed to “extends to Jones Avenue.” As shown on Map 4, it appears that both sheet flow and BFEs occur in this FHA.
- Page 8-3, par. 5. Specify which levee bank needs certification.
- Page 8-4, par. 2. A total structure value has been estimated even though previous sections indicate that no structures have been built. If a LOMR is completed for future projects and BFEs are met, where will the current losses occur?
- Page 8-5, par. 3. The cost for annual vegetation maintenance should be considered (i.e. planning, permitting, removal, etc.) and included in the plan.
- Page 8-6, par. 1. It should be emphasized that the Awareness Floodplain maps are a not replacement of the FIRMs, but provide a planning tool. A discussion of how the Awareness Floodplain maps were developed in relation a FIS should be included.
- Page 8-11, Table 8-2. Will the ranking of alternatives in the action plan’s prioritization list receive further refinement? The ranking does not reflect the various proposed costs for projects in FHA # 2, 4, and 5. The ranking appears to be cursory and needs additional refinement based on information in the plan.
- Action A. See previous comments for FHA #2. A project area map and details would be helpful.
- Action B. See previous comments for FHA #4 which includes the area’s limit at Jones Avenue.
- Action C. Did the new development occur prior to the 1998 FIS or the ordinance change in 2000?
- Action D. A map should be provided to identify the details of the proposal. Will there be seepage issues with this proposal? Why does Action D’s project

management differ from Actions A, B and C. The budget appears incomplete without details and costs for increasing the height of the levees and modifications to the diversion structure. Table D-1 does not relate to proposed projects.

- Action G, page G-3, par. 4. The FEMA audits should be routinely reviewed. Previous audits may highlight past problems areas. Audits do not confirm that all buildings in the floodplain are built above the BFE. The audit reviews recent development (new or improved) to determine if the Floodplain Management Ordinance / NFIP regulations have been met. Pre-FIRM and pre-2000 structures did not have to meet current requirements for building 1 foot above the BFE.
- Action I, Page 1-2, par. 3. The Butte County Floodplain Administrator should ensure the accuracy of information and FEMA mapping that is available through CSUC GIC.
- Action J, Figure J-1. Who from DWR has been contacted for participation on the advisory board?
- Glossary. The definition for BFE should be "The height of the base flood, usually in feet, in relation to the National Geodetic Vertical Datum of 1929 or other datum as specified."
- Glossary. A description of the flood zones should be provided under SFHA.
- Map 2. The levees along Cherokee Canal should be delineated.
- Map 4 & 5. Provide a greater contrast in blue color schemes for Zone A and AE.
- Map 14. The GIS projection for the Black Butte Inundation Map does not match the base map (see offset for Sutter Bypass).
- Map 24 & 25. The stations need to be edited based on comments for Table 4-1 (see attached). This should remove some duplicate points and add other stations in the Chico area.
- Map 29, 30 & 31. Change the color/hatch scheme to show SFHAs in conjunction with the one-mile perimeter. The one-mile perimeter hides the relationship between inundation areas, evaluation routes and shelters.

Mr. William Johnson, Watershed Coordinator  
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- Map 32 & 33. Change the color/hatch scheme for representing the population density. In the city area, the density cannot be seen.

If you have any questions, please contact me at (530) 529-7347.

Sincerely,

A handwritten signature in black ink that reads "Todd Hillaire". The signature is written in a cursive, flowing style.

Todd Hillaire, Chief  
Flood Management Section

February 21, 2005

William Johnson  
Watershed Coordinator  
PO Box 1611  
Chico CA 95973  
[creek@inreach.com](mailto:creek@inreach.com)

Subject: FMP COMMENT

Dear Mr. Johnson:

Thank you for the opportunity to comment on the Butte Creek Watershed Floodplain Management Plan. The Chico Paddleheads is a local club with about 100 members. While the information on the project setting and purpose are adequate we find many aspects of the report troubling. Some comments from Chico Paddleheads that have reviewed the plan include:

- We find the document conclusions unclear and buried in the document, and several key omissions of information. We hope that this is rectified in the next version and not an attempt to hide the conclusions in technical jargon. The Executive Summary for example, could have been written before the project was completed because important conclusions and findings are omitted.
- As we understand CALFED's multiple objective approach, we find the plan extremely lacking. The plan basically dusts off 1950's plans and calls them the solution (by simply raising them). We are mystified why more creative solutions, such as set-back levees, flood-proofing existing structures and requiring future ones to be built to survive floods, nonstructural solutions, and purchase and removal of threatened structures, are inadequately treated in the document. Set back levees for example, may allow for the plan to meet the objectives set out in the plan. The approach of the document is unimaginative, expensive (when all costs: annual maintenance and environmental), and unacceptable.
- One of the project objectives is to "develop flood protection measures that protect life and property and enhance fish and wildlife habitat." We find little in the plan that provides any benefits for fish and wildlife. And many of the measures, such as "clearing stream vegetation" would be extremely damaging and cause irreparable harm. These damages are completely ignored in the document.
- The plan appears to have been created strictly by engineers with the intent of building levees. We suggest that the consultant incorporate at least some basic biological information and analysis in the plan.
- We are a bit mystified on some of the material in the risk assessment section. It appears to be cut and pasted from other documents without a clear link to the Butte Creek project.
- The repetitive loss statements seem to indicate that these structures are located in high risk areas and should be removed, rather than spend public money to subsidize poor decisions. It appears that the reasons for action

appear to be more related to changing insurance rates rather than any compelling protection of public safety.

- The values noted in Section 8 are not clear and appear inflated. For example, in Flood Hazard Area 1 the plan notes that properties have reported over \$80,000 due to flooding since 1973. It seems difficult to justify the \$11 million "fix" with \$80,000 in losses over many decades. However, the plan notes a potential \$72 million loss from flooding. We would appreciate to see actual losses and assumptions laid out in a simple comparative manner.
- Many agricultural crops can tolerate flood events depending on timing, were any ag losses calculated?
- Do any of the orchards within the floodway along Butte Creek have Encroachment permits? Can these be made available as part of the document?
- The plan presents the results of the hydraulic modeling but not the approach and assumptions, how can we evaluate that information.
- We do not see any substantial solutions related to the railway bridge along Midway, although this seems to have a very significant impact on damming upstream flows during a levee failure event.
- Besides the serious environmental consequences of clearing vegetation along this important corridor. It's extremely costly (note the \$38,000 per stream mile) and would likely have to reoccur for the life of the project. Over a long enough time, this cost could be used to buy up the most threatened properties.
- Butte Creek is a critical watershed for endangered salmon and many other organisms, the plan lacks any real description of the impacts on ecological resources.
- Finally, we are gravely concerned about the limited public input into the plan, especially from this point onward. This document is narrowly focused and we find it difficult to believe that it meets CALFED objectives (or even the objectives laid out in the document). We suggest another, more complete draft that the public will be able to comment on before another version is produced. As presented, the plan is inadequate and not credible.

For many of our members, Butte Creek is our home river. We care about the aesthetic, recreational, ecological conditions of this community resource. The plan appears to entertain a narrow range of benefits to only a handful of property owners. This river is not just about conveyance, but about quality of life, important fishery resources, and other important values view that benefits many more residents of Butte County. Thank you.

Sincerely,

Elaine Ellsmore  
1653 Normal Avenue  
Chico CA 95928  
530-518-1530  
eellsmore@pvchico.org

## Butte Creek FPMP Draft Remarks 2/22/05

Flood Hazard Areas 2 and 3 would likely benefit from construction of set-back levees which would provide greater capacity for large events, lower flood elevations, less head pressure on levee sections, lower velocity and less erosive flows. This would create Fail-Safe conditions with less damage to infrastructure (such as bridges) and habitat while accommodating 100-year flows. Areas 2 and 3 are situated in a rapidly developing urban/suburban area (South-east Chico to North-east Durham) that economically, cost effectively, warrant this level of reliable protection. Increasing the height of the levees provides only one dimensionally increased capacity but requires more rigorous maintenance and threatens more devastating flows if maintenance fails. These levees are already rather tall and a failure near Butte Creek Estates, Lott Road or along Stanford Lane could well be catastrophic. The levees in these reaches currently sit adjacent to relatively undeveloped orchard land on one bank and could be economically set-back.

The bridges in Areas 2 and 3 show effects of limited capacity, restricted erosive flows and poor design. The bermed section of the railroad crossing at the Midway demonstrates lack of cooperation from the rail-road by creating a dam within the levee. This is unacceptable and should be dealt with effectively. The stream is known to carry large amounts of woody debris from the upper watershed that completely blocked flow at the rail-road bridge in 1997 and caused damage at the multi-pier Durham-Dayton bridge. (It is curious to note that the right bank levee at Midway appears de-graded to accommodate the road, allowing escape of flood flows and possible failure of the levee.) These bridges need to be replaced with designs that present minimum restriction of flow. Further, these fewer piers need to be protected from undermining that occurs when fast water flows around log-jams.

Riparian forest that would naturally occur in the Butte Creek floodplain would provide such protection by intercepting debris flows and ameliorating and distributing water flow in wide channels within set-back levees. Accumulated debris could be removed as necessary in the dry season. Lowered flood elevations within the set-back levees would reduce erosive forces on the infrastructure and habitat.

It seems to me that we've decided to manage the floodplain systematically for this watershed and possibly for others throughout the county. If this system is to serve as a model we need to look realistically at its sufficiency. We've decided that it is not sufficient for 100 year events, yet we propose only minimal changes of dimension and method. That's as if to say that the methods of the last 40 years that brought us to this point of insufficiency are suitable for the next 100 years. Development has steadily increased on lands in the floodplain and can be expected to increase putting still more life and property at risk. We've had 2 events of comparable magnitude in 20 years. One of those was supposed to be a 500 year event, so should we feel confident awaiting the next 100 year event? These estimates of flow are questionable given the dearth of gages and the record of flows that scarcely spans the 100 year event. These estimates of flow seem contradictory and inherently invalid. Furthermore, structures of this design will require the same rigorous maintenance (channel clearing and de-vegetation) and heroic

flood-fighting ( rip-rapping ,sand-bagging and debris removal) required by the insufficiency of the old design.

What is needed is a change in scale comparable to other safety standards. For chains, lifelines and building materials strengths of 300% of load are typical. In the leveed reaches of Butte Creek we should be providing capacity increases of 20% or more. The benefits will be first ,safety as well as durability, ease of maintenance and sustainability of the habitat and integrity of the stream functions. It is regrettable that set-back levees was not given more consideration.

Whether we're considering Butte Creek or others around the county we should establish standards for bank protection structures so that they're effective without reducing capacity or causing erosion across or downstream or unnecessarily eliminating habitat. An example of poor design can be seen on the right bank upstream at the Oro-Chico bridge. The rip-rap encroaches into the channel cross-section where restricted , high velocity flow was cutting into the toe of the levee prism. The rock was placed unnecessarily thick and tall thus further restricting flow. An excessive amount of rock was hauled and paid for. There are numerous such examples. Grouted rock structures are often over-kill and particularly destructive of habitat . Loose rock structures tend to settle and bind in place, like earth-fill dams and offer a place for vegetation. Grouted structures tend to fail as the water cuts around behind the monolith and leaves it standing alone plugging the channel.

Given that the 100 year flow in Little Chico is so small(<15% of Butte Creek) these considerations are of lower priority than those previously discussed. However, as we may extend this model plan county-wide and as the City of Chico is continually increasing storm water flows into Little Chico, I think it is appropriate to conduct more than a cursory study of capacity in Little Chico. Surely capacity is substantially reduced by vegetation (though not increased since FEMA because it had not had any maintenance since years before) ,but after the non-native vegetation is removed , it will probably be clear that capacity is greatly diminished by hardscape and encroachment.

As the need for increased storm water capacity grows it becomes more feasible to obtain it in the original floodplain. This would require continued acquisition of creek-side access, removal of man placed rubble, floodplain excavation and possible restoration to a fully functioning riparian asset for the community. In the event of failure or malfunction of the existing diversion much of Little Chico's flow could come through the original channel--ready or not. It seems this contingency should be accommodated so far as practical. Then the flow split could be shifted with less reliance on "excess capacity" in Butte Creek.

I hope these observations will benefit the planning process. I appreciate the opportunity to contribute.

Robin McCollum  
Superintendent - Flood Control  
and Drainage Districts (1994-2004)  
Butte County Public Works -- Retired

February 22, 2005

Eric M. Ginney  
1144 Spruce Ave.  
Chico, CA 95926

Mr. William Johnson, Watershed Coordinator  
Butte Creek Watershed Conservancy  
PO Box 1611  
Chico, CA 95927

Dear Mr. Johnson,

I am submitting the following comments on the Draft Butte Creek Watershed Floodplain Management Plan. Although I am a member of the Board of Directors for the Sacramento River Preservation Trust, the trust is submitting separate comments and I am submitting these comments as a concerned citizen of the County of Butte.

I am a technical professional with expertise in water resources and fluvial geomorphology. I am also a member of the Butte Creek Watershed Advisory Committee, a group that was originally proposed to assist in crafting this plan, but whose guidance was never sought. More importantly, I have spent literally thousands of hours surveying, studying, and working on Butte Creek in all of the key reaches that would be affected by this draft plan. I have also completed CALFED-sponsored research and planning on Butte Creek, the Sacramento River, and other local stream systems.

First and foremost, given the advanced state of practice and knowledge of floodplain managers in the Western United States, the off-target text comprising this draft document should be re-titled. A more appropriate title might be "A Plan for Reducing Flood Insurance Rates for Selected Watersheds in Western Butte County, CA." Floodplain management is a comprehensive technical discipline in our society, integrating multiple elements of science and planning to find solutions that address the multitude of issues that surround streams and their floodplains. While text sections in this draft document run the gamut of topics from fire and hydrophobic soils to flood elevations and insurance rates, little comprehensive effort is actually expended in describing, discussing, planning for, or *managing the floodplain* of Butte Creek. Moreover, it addresses only certain portions of the Butte Creek watershed, and then only addresses selected floodplain issues, specifically: flooding and its relation to the Federal Emergency Management Agency (FEMA), United States Army Corps of Engineers (USACE) levee certification, flood insurance, and public safety. Quite simply, this document is off-target relative to its title, and, as will be demonstrated in the course of these comments, relative to the scope of work proposed to CALFED.

There are numerous typographical and factual errors in this document, in fact too many to merit the substantial time it would take to call attention to all of them on a page by page basis. I have included a small sampling of such errors; however, many of these errors are not typographical in nature, but rather appear to display a lack of attention to detail and deficient knowledge of issues, geography, and fact—all elements of a technical document that should be well-developed by the time such a product is released for public review. For example, it should not fall to reviewers to inform the authors of a \$528,000-plan that although there are vernal pools within the drainage basin, the unique Vina Plains are in fact *not* a part of the Butte Creek watershed. Further, roads and stream crossings that are not yet constructed should not be

shown on maps as such actions portray a false sense of the existing infrastructure in the area for unknowing reviewers. Again, an effort of this caliber deserves better.

### **General Comments**

In my professional experience, I have been fortunate to work on planning efforts similar to this type of project. As a member of the Northwest Floodplain Managers Association I have also attended professional meetings for floodplain managers working to address the very same issues experienced by Butte Creek. The work of myself and others presented at those meetings has been undertaken in river systems larger and far more complex and unpredictable as compared to the already-leveed Butte Creek system. Similar to Butte Creek, those river systems are home to endangered anadromous salmonids, oftentimes multiple races and species. Yet quite different from this planning effort on Butte Creek, the fact that the river and its floodplain are utilized by endangered fish species was not only addressed, it was placed forefront in developing strategies to resolve issues.

Addressing habitat and fish in these plans was not done to appease some sort of radical environmental constituency. Rather, “the environment” was factored into the approach on those other plans because it simply makes sense to do so. Endangered Species Act (ESA) issues, Clean Water Act issues, NOAA Fisheries critical habitat designation issues, (and on the list goes) all come into play when managing a complex stream floodplain such as Butte Creek’s. To completely ignore these issues is to ignore a crucial element in project development and design. It is quite simply the state of common practice in today’s society for engineering and planning consultants to not only inform their clients of these environmental considerations, but to comprehensively address these issues in conjunction with the “more traditional” portions of their practices of designing structural solutions, evacuation routes, or information plans. This ensures that resource agencies with crucial permitting authority are comfortable with how floodplain managers are addressing human needs (ie flood damage reduction and increasing public safety) while at the same time addressing the needs of the ecosystem. Ultimately, this approach saves the client money—and in this case, that client is the taxpayers of the State of California.

Unfortunately, this draft document does none of these things, and so totally ignores such environmental issues as to suggest either incompetence on the part of the preparers, or a sophomoric effort to keep these issues out of the report, perhaps in an effort to “make things easier.” Sadly, such an approach does just the opposite. In my professional opinion, nearly every action or “mitigation measure” proposed in this plan (except for those involving emergency preparedness and evacuation) will result in not only substantial resistance from local and national environmental organizations, but will not in their current form be capable of passing through existing state and federal environmental review processes. This “plan” in its current form is not in the best interest of the citizens of this County, and that is being stated from a “fiscally conservative” standpoint, not an environmental soapbox.

While this draft document falls short on so many fronts in addition to the shortcomings noted above, it is honestly difficult to know where to start. Making review of this plan even more difficult is the fact that Appendices G, H, I, J, and K are not included in the draft document. A satisfactory review of this plan cannot be conducted when crucial information such as the Appendix G “calculations sheets” (which include the cost-benefit analyses referenced in making key decisions on mitigation measures in Section 4.0) are not included. These sections must be made available and the comment period for this document must be extended at least another 90 days from the date of that material being made available.

Finally, having read and reviewed this draft plan and comparing it to other efforts I have reviewed, it is quite clear that the entire process and paradigm associated with this draft Butte Creek plan is abnormally predisposed toward reducing flood insurance rates for lands surrounding Butte and Little Chico Creeks through implementation of essentially one structural solution: raising the height of existing levees to

obtain USACE certification. Aside from some fairly common-sense emergency preparedness and evacuation measures, this plan entirely fails to comprehensively look at the floodplain and address other floodplain issues (i.e. the fact that aquatic and riparian habitat is degraded by the existing flood control system, levee and bridge maintenance is increased because of the design of the existing flood control system, etc.).

### **Scope of Work vs. Draft Deliverables: A Project Off-Target**

A full discussion and line-by-line evaluation of the Scope of Work and Budget Summary submitted to CALFED for this project relative to the work elements actually implemented and the draft plan currently available for review are beyond the scope of this comment letter. However, even a cursory comparison of the Scope of Work and Budget Summary to what process participants actually observed finds substantial disparities. I strongly suggest that CALFED review not only the content of the draft document, but also solicit input from project administrators to determine to what degree this project actually implemented funding in accordance with the Scope of Work and Budget Summary as contained in the Full Proposal to CALFED.

For example, section 4c of the Full Proposal indicates that “Once the scope of the Plan begins to emerge, Butte County and the Conservancy, in coordination with the Watershed Advisory Committee [WAC], will evaluate the institutional needs for implementation, maintenance, and monitoring. The public information and outreach will continue to keep the general public and stakeholders informed of progress.” Section 5c of that proposal also notes in bold that “The **Watershed Advisory Committee (WAC)** will be utilized as a citizen monitoring body.” And goes on to state that “The importance of this approach is reflected in the credit points awarded by the [Community Rating System] CRS program. Having a planning committee with at least half of the members from the public is worth more points than any other single item in this CRS activity.” As a member of the WAC, I was never contacted to coordinate on this planning effort, and furthermore, as will be noted in other comment letters I am aware of, input from certain members of the public and NGOs has been ignored and unrecorded in the meeting records displayed in this draft plan.

The budget summary indicates that over \$18,000 were to have gone to newsletters to inform the public about the project. No such newsletters are known to have been received according to an informal poll of WAC members that I conducted.

Tasks 6 and 7 in the Scope of Work clearly lay out perhaps the most important elements related to preparation of this plan: identifying and defining flood hazards and formulating mitigation strategies and measures. This is really where the rubber meets the road. This is where all inventoried hazards, the details of field reconnaissance and other research, and the effects of the existing flood control system should be chronicled. Then, with a clear understanding displayed for everyone, the work undertaken in Task 7 should then provide and display the most complete range of alternative mitigation strategies and measures possible. These alternatives should include all techniques and strategies available to the professionals undertaking the preparation of this plan. With all of these available to the stakeholders in the planning process, the professionals creating the plan should establish criteria to prioritize these alternatives, and then present those criteria and the prioritized alternatives. For instance, Task 7b states that “Each strategy and measure will be described in terms of purpose, location, benefit/accomplishment, *environmental impact*, cost, ability to implement, public/landowner participation, lead agency, and subareas affected.” Unfortunately Section 4.0 presents only levee improvements, channel improvements, and diversion to another stream system as potential mitigation measures. For each Flood Hazard Area one, or at most, two, different alternatives are presented.

Based on the proposal to CALFED, which emphasized public involvement, it seems that there should be a record of the strategies and measures that were developed prior to selecting only those that "...“survive” the test of stakeholder and public acceptance” (Task 7d, page 19, Scope of Work). In short, the plan should contain a matrix with 1) the criteria for selection of strategies and measures, 2) a complete list of all potential strategies and measures, 3) application of each of these strategies and measures to the Flood Hazard Areas with respect to the elements outlined in Task 7b (noted above), and finally 4) presentation of the chosen strategies and measures along with the reasons (both pro and con, as related to the chosen criteria) for selecting these strategies and measures and for not selecting others. This need not be complicated, and could be accomplished through a series of tables or matrices. This then clearly shows the thought processes and rationales for either selecting or rejecting certain strategies and measures.

Page 8 of the Scope of Work, Section “a”, states: “The following is a short list of benefits that can be measured using appropriate and established measuring techniques: reducing water supply contamination by floodwaters, reducing silt loads on streams and tributaries, protecting groundwater quality from flooded wells, improving water quality derived from established Best Management Practices, coordinating flood hazard mitigation procedures, *protecting wildlife habitat by adaptive management measures*, increasing local stewardship values, and environmental education enhancements.” The concept of adaptive management is *never* discussed in the draft plan, nor is stewardship and protection of wildlife habitat.

Task 2 of the Scope of Work states that the Butte Creek watershed will be addressed according to the geographic subareas identified in the Existing Conditions report. These areas were to include Butte Meadows, the Canyon Section, the Valley Section, and the Butte Basin. The scope also mentioned attempting outreach to the Sutter Bypass; however, it is unclear if this was actually attempted. What is clear is that the plan does not address flooding in all four of the geographic areas specified in the proposed scope of work, totally neglecting Butte Meadows and giving little if any attention to the Butte Basin.

Finally, it is often useful to compare the contents of a plan or report with the stated objectives. The four objectives of the Butte Creek Watershed FMP are copied below in bold (from page xiii of the draft plan) and comments as to the adequacy of the plan’s response to each objective are presented after the objective:

**1. Utilize relevant information to develop flood protection measures that protect life and property and enhance fish and wildlife habitat.**

The protection of life has been addressed in the plan, although it could be argued that by increasing levee heights citizens would actually be in more physical danger while ironically being located in a “safe” area according to flood insurance rates. The enhancement of fish and wildlife is another story. I presume that CALFED envisioned a balanced approach to achieving this objective. Unfortunately enhancing fish and wildlife habitat is totally unaddressed in this plan. To quantify this point, I searched on the word “habitat” and outside of being referenced in these four objectives, it was only mentioned once, and then only in the context of the *Sacramento River’s* habitat. It seems rather ridiculous that the habitat of Butte Creek is not specifically mentioned or discussed, but that of the Sacramento River is.

**2. Support improved performance and coordination among and within agencies responsible for providing flood protection, post-flood restoration, and protection of habitat.**

In contacting several agency representatives (i.e. NOAA Fisheries, USFWS) I found out that many of the key agency personnel responsible for this part of the Sacramento Valley were totally unaware of this plan.

**3. Support the development of pre-flood emergency response management.**

There are several excellent recommendations in the plan in this regard. Additional climatic variable should also be incorporated (see later comments).

#### **4. Establish criteria for development within the floodplain, which would not adversely impact the floodplain, flood flow capacity, or neighboring properties.**

This objective is also addressed in the plan, however the definition of “not adversely impact[ing] the floodplain” is not stated, and should be interpreted to include floodplain habitat. As such, although this objective is addressed, more work is needed.

#### **Fire and Floodplains**

The text discussing the effects of fire and runoff (Page 3-5) are speculative and perhaps sensationalized. The text states that “The increase in discharge from runoff over areas where vegetation was lost due to fire was over 100 percent. The flow increased 200 and 300 percent at some locations.” No modeling results are provided and no data is presented. Any proficient hydrologic/hydraulic modeler can create such results by altering key parameters in HEC-1. Without the model inputs clearly displayed, the information presented is without basis. Further, there is no indication that the model was calibrated.

After the fires in 1999 (where substantial portions of Little Chico Creek and Butte Creek Canyon were burned), many community members pressed CDF to scientifically monitor runoff and other parameters during the fall rains. Unfortunately this was not done. However, it is clear from an even cursory analysis of rainfall and creek discharge records that any increases in runoff were in no way close to the claims made in this draft floodplain management plan. While the plan has assumed “worst case conditions,” such an assumption seems out of context, and unsupported by empirical evidence.

Finally, attempting to link the effects of a wildfire to decreased infiltration and decreased groundwater recharge is an interesting but extremely poorly developed and poorly substantiated concept. The text states: “An intense and wide-spreading fire in the County *would* have a significant impact on the recharge rate and water quality in the groundwater subbasins.” (page 3-6; *emphasis added*). This statement is purely speculative, unsubstantiated, and should either be fully evaluated or deleted from the text. No information in this draft document, preceding nor following this statement, ensures that this would happen. Soils information and characteristics—perhaps the most important element in determining hydrophobicity following catastrophic fire—are entirely absent from this plan, as is even any mention of the importance of soils, the extremely high degree of variability of soil types and characteristics in the Butte Creek watershed, or the fact that there are no reports of hydrophobic soils forming following any major fires in the Butte Creek watershed. Again, this is a floodplain management plan, and the text is delving into subjects that are far beyond the scope of managing the floodplain of Butte Creek. Further demonstrating this point is the fact that the plan never again addresses or ties in this poorly-developed discussion of hydrophobic soils and potential for decreased groundwater recharge.

#### **Comments on Selected Plan Sections**

##### **Section 1.0**

A physical description of the floodplain of Butte Creek should include technical information regarding topography, soils, drainage pattern, physical processes before and subsequent to flood control measures, and (at the least) mention of the role of the creek and its floodplain as habitat for fish and wildlife species—including endangered species utilizing Butte Creek for habitat. The closest thing that this draft document provides for a description of the creek comes from text I authored for the Butte Creek Existing Conditions Report. That text is inappropriate and inadequate for use as a description of the Butte Creek floodplain. I (and others) have authored other papers on Butte Creek that contain far better descriptions (and histories) of the Butte Creek floodplain. Upon request I would be happy to provide access to these

papers or direct the authors of this study to their location in public institutions. They all contain comprehensive descriptions of the historic and current conditions of the creek and its floodplain, including substantial mapping resources.

## **Section 2.0**

Earlier comments cover the fact that attendees of meetings and key comments (some provided in writing) have been left out of this plan's documentation and certainly appear to be absent from the thought processes used to determine the mitigation strategies and measures.

## **Section 3.0**

Section 3.0 begins with the following introduction: "Following the evaluation and mapping of *natural hazards*, a risk assessment of the watershed's vulnerability to those hazards is performed." (*emphasis added*). Interestingly, all of the flood hazards except for the out-of-bank flooding on the right bank of Butte Creek in lower Butte Creek Canyon (Flood Hazard Area #3) are not really natural hazards, but rather instances where *anthropogenic* actions have created hazards. A good example is the inadequate conveyance in the Little Chico Creek-Butte Creek Diversion Channel leading to potential flooding in the Doe Mill Neighborhood—something that has little to do with a *natural* hazard. Further, there are adverse effects of the current flood control system that are not described or acknowledged, and all this plan does is build on those old paradigms without adequately reviewing or evaluating existing conditions. For instance, the current flood control system creates relatively high water velocities, increases water surface elevations, and has substantial bed and bank shear stress—all potentially damaging or detrimental to both the environment (in terms of aquatic and riparian habitat) as well as the levees themselves and other crucial infrastructure (i.e. bridges). That these other issues are not discussed and the focus of the plan from Section 3.0 forward becomes reducing flood insurance rates is disappointing and deleterious to this plan being able to meet its stated objectives.

The portion of Section 3.0 that identifies social, cultural and environmental assets is of particular concern because the authors seem to blindly take stabs at assets that might be of value, but hit items in the county (or outside the county) that are not ever going to be effected by actions on the Butte Creek floodplain (namely the Vina Plains, the "Central Buttes." The fact that there is no mention of Butte Creek as valuable salmonid habitat is startling given the funding that CALFED has expended to help protect endangered species within the creek system. Again, it appears that the preparers of this plan are not familiar with the issues or geography of the area.

## **Section 4.0**

The introductory text in the beginning of Section 4.0 is ridiculous when the rest of the section is reviewed. None of the "Primary Mitigation Measures" work to keep "people and structures out of harm's way *while protecting the natural and beneficial functions of the watersheds and floodplains.*" (*emphasis added*). So little discussion or thought is given as to the beneficial functions of watersheds and floodplains as to be disrespectful of the reader's intelligence. For instance, in Flood Hazard Area 1, channel widening was deemed too costly.<sup>1</sup> Instead, "levee improvements" are proposed and evaluated. In this and in all other cases, it seems that "levee improvements" actually means "increase the height of the levees." No other alternatives are discussed. This area of Butte Creek has been identified by others

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<sup>1</sup> It would be nice to see the calculations in Appendix G. The text on page 4-3 simply states they "will be included;" however, when the reader reviews Appendix G, the reader finds they are NOT included. Further, is this note in the text stating that the information "will be included" a reminder to the authors to place this information in Appendix G, or is it that the reader does not get to review this information until the final draft? The repeated confusion between the draft and final document in the text of this plan is disconcerting.

(specifically by myself in the work that I conducted on Butte Creek with John G. Williams and G. Mathias Kondolf, as referenced in the back of this very draft document) as a prime candidate for setback levees, offering flood damage reduction, decreased risks for humans and their property, and not least of all, benefits to fish and wildlife. But this alternative was not even discussed or evaluated.

Flood Hazard Area 4 is also targeted with increased levee heights. This is an area where analysis of sequential historic aerial photographs will clearly show that landowners on the right bank of the creek downstream of the Skyway have encroached into the creek, constricting the creek and reducing floodway capacity. Enforcement of the floodway in this area should be a priority over structural improvements to the levees at taxpayer expense. Again, as stated in other portions of these comments, the areas, locations and descriptions of Flood Hazard Area 4 do not seem to make sense and it is requested that the authors review both their text and the geography of the creek and infrastructure that they specifically mention to ensure better accuracy of fact in the text.

Flood Hazard Area 6: it is my understanding that no survey work was undertaken to support the hydraulic analysis noted on page 4-6 (A. Carmi, 02/05). Because the conclusions reached from this analysis are supporting major re-working of the Little Chico Creek flood control system, it is unscrupulous to base such conclusions on analysis conducted without actual survey data. Further, while the systems are clearly connected, it is unclear why the details of flood control for Little Chico Creek need to be discussed in such detail in a floodplain management plan for Butte Creek.

Finally, it should be noted that the discussion and evaluation of mitigation measures in Section 4.0 are sporadic and lack a comprehensive framework. Some Flood Hazard Areas discuss and note that evaluation was conducted for one or another actions, but no consistent set of alternatives was apparently applied to each area. For example, on page 4-4, diversions to Hamlin Slough are noted to “face challenges and require adherence to environmental regulations and policies.” No other mitigation measure was noted to face such challenges and ‘red tape.’ But guess what? ALL THE ACTIONS in this plan will be subject to these same “challenges.” Again, all of the alternative mitigation strategies and measures need to be evaluated against consistent criteria.

To summarize Section 4.0, the Primary Mitigation Measures seem to be unduly focused on increasing levee height (while failing to document or evaluate other alternatives) and the General Mitigation Measures seem to be overly focused on emergency management (over 15 pages). The lack of a comprehensive approach to floodplain issues shows through clearly in this section.

## **Section 8.0**

Section 8.0 claims to “provide a brief overview of the evaluation process associated with the mitigation measures identified in Section 4.0.” However, examination of this section actually shows that no overview of the evaluation process is provided. Rather, the mitigation measures identified in Section 4.0 are in most cases simply put to a cost-benefit analysis and defended relative to economic considerations—true public safety considerations and protection of infrastructure is typically cast aside.

The repeated phrase “...[the levees] lack adequate freeboard for a 100-year event determined by FEMA, although a recent 500-year event did not overtop the levees...[the levees] still do not meet the FEMA requirements for freeboard in many locations, and are not certified.” Such comments are ridiculous and speak directly to this plan’s bias toward ensuring levee certification and rate reduction: what we actually have is not flooding risk, but insurance risks. If the levees can *actually pass a 500-year event*—a flow event that generally triggers an “Act of God” clause—then perhaps concerned citizens should contact FEMA and communicate any concerns regarding levee certification and FEMA freeboard requirements.

**Additional comments regarding actual mitigation strategies and measures proposed in this draft plan will be submitted once all information necessary for review of the plan (i.e. Appendices G through K) is made available with a subsequent period of time for review.**

**Selected Errors, Oddities, and Comments**

- Flood Hazard Area #4 seems mischaracterized: “a levee failure at the west side of the Little Chico Creek-Butte Creek diversion channel” would not inundate the golf park located on the east side of this diversion channel and up-gradient of the described failure. Either the source of flooding has been misstated in this description (flooding in this area has in the past come from Comanche Creek, the Parrott-Phelan Diversion Canal [which becomes part of Comanche Creek] and Butte Creek flow leaving Butte Creek upstream of Skyway and flowing into Comanche Creek) or the area that would be flooded by a west-bank failure of the Little Chico Creek-Butte Creek diversion channel should be revised.
- Page 1-1, second to last paragraph: This section of what appears to be plagiarized text should either continue the description of how Butte Creek can enter the Sacramento River in multiple locations or delete the word “either.” The latter seems more appropriate as this study has little to do with Butte Creek south of the Butte Slough Outfall.
- Page 1-2, first paragraph: does the entire county receive a range of 20 to 80 inches per year or do some areas of the county receive 20 inches/year and other areas 80 inches/year? This is a poorly phrased sentence. Climate plays an important role for areas such as Butte Meadows, where rain-on-snow events can cause ‘upland flooding’ local to that area, as well as promulgate flood events in the Valley reaches of Butte Creek (i.e. 1997). Freezing levels, snowpack, and antecedent soil moisture are all important factors in determining and ultimately attempting to predict, flood events on Butte Creek. Climate should be given more discussion, with an eye toward providing data and discussion of the factors described above for inclusion into plan’s proposed ALERT Network, giving authorities additional information and forecasting ability.
- Page 2-3 indicates that “The draft Butte Creek Watershed FMP was provided to the stakeholders through the BCWC website and input was used to produce a final draft.” This statement is confusing: The document in which this text is included is a DRAFT document, dated December 20, 2004. No final draft has been produced. Any text referring to a final document is inappropriate for the draft itself and such language should be included only in the final version of this document.
- Page 3-4: the proper name of the new development near the Little Chico Creek-Butte Creek diversion channel is the Doe Mill Neighborhood, not the Doe Mill Lane subdivision.
- Maps on the BCWC website do not include Map 4. As this draft plan was not widely distributed in hardcopy form, the fact that this map was not available on the internet is a substantial issue.
- Action Plan J should have a method for public comment to the IRUC.
- The educational materials presented in Appendix E address natural processes such as fire and flooding out of context. Both are natural parts of our environment, and only become a “problem” when humans have placed themselves or their property in the path of these natural processes. CALFED should reconsider whether it wishes to support such ‘education’ when the context and complexity of such important issues are presented in such a one-sided manner. Again, the linking

of fire to negative effects on recharge and potential aquifer contamination seem out of context in this watershed given its specific fire regime and soil conditions.

### **Conclusion**

The content, tone, and details of the Draft Butte Creek Watershed Floodplain Management Plan still require substantial work. The only way for this plan to approach a level of quality acceptable for endorsement by the people of this county is for the development process to be re-opened. Input from state and federal resource agencies and other stakeholders *must* be incorporated rather than ignored, and the original scope of work—included in the contract with the State of California—must be adhered to and completed.

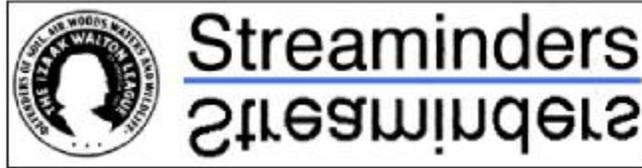
I appreciate having had the opportunity to comment at this time. I again extend my offer to assist in providing information that can improve this plan. I look forward to reviewing future drafts.

Regards,

Eric M. Ginney  
1144 Spruce Ave.  
Chico, CA 95926

CC:

Butte County Board of Supervisors  
CALFED Bay-Delta Program  
Mr. Howard Brown, NOAA Fisheries  
Mr. John Icanberry, USFWS  
Mr. Paul Ward, CA Dept. of Fish and Game  
Mr. Fraser Sime, CA Dept. of Water Resources  
Interested Parties



chapter of the Izaak Walton League  
P.O. Box 68, Forest Ranch, Ca 95942

THE BUTTE CREEK WATERSHED CONSERVANCY FLOODPLAIN MANAGEMENT  
PLAN (DRAFT PUBLIC COMMENT DOCUMENT)

**Comments submitted by Roger Cole for Streaminders -chapter of the Izaak Walton League  
and for the Big Chico Creek Watershed Alliance (BCCWA), Feb. 23, 2005.**

Please submit to the formal record. For more information or clarification please contact **Error!**  
**Reference source not found.** @ streamrc@earthlink.net or 530-895-0866.

According to the CalFed document: BCFMP2-05 Calfed0032 (from the CalFed website).

“The four objectives of the Butte Creek Watershed FMP are to:

1. Utilize relevant information to develop flood protection measures that protect life and property and enhance fish and wildlife habitat.
2. Support improved performance and coordination among and within agencies responsible for providing flood protection, post-flood restoration, and protection of habitat.
3. Support the development of pre-flood emergency response management.
4. Establish criteria for development within the floodplain, which would not adversely impact the floodplain, flood flow capacity, or neighboring properties.”

“Although the recent (1997) recent 500-year event did not overtop the levees, it still does not meet the FEMA requirements for freeboard in many locations, and are not certified.” Costs are estimated from \$, 1,300,000 - \$1,537,000/ mile over \$22,286,000 for the entire system. This raises the question of opportunity costs. The system passed the 1997 event largely without damage. What does \$22 million of certification and levee raising buy Butte County? Where will the money come from?

It’s hard to see how the raising and certification of levees can have any positive effect on habitat. In fact, our largest disappointment with the study is that habitat concerns were given such short shrift. The word habitat appears only 6 times in the entire document.

We have detailed figures for borrowing soil reclamation of borrow sites stripping levees but we don’t see numbers for restoration in what is likely to be a very habitat destructive activity. The permitting of this activity will be substantially complicated and made expensive by ignoring Critical Habitat concerns.

Raising levees makes them more dangerous... the pressure on the levee is directly proportional to the height of the water. in one instance at a levee break near Maryville YC a 30 foot levee gave

way. The owner of a brick house that had been adjacent to the break told me that he couldn't even find one brick after the break!

There is no discussion of the possibility of levees setbacks or floodplain excavation combined with setback or whether there are any choke points in the system.

We don't have a Multi-Objective Flood Mitigation Alternatives Analysis because we don't seem to have multiple objectives. The only objectives seem to be to reduce flood insurance costs and increase safety. These are certainly worthy goals. However in 2005 we need multiple objectives to design a successful plan. These should include maintenance costs and habitat concerns.

We don't have an assessment of environmental impacts and difficulty of raising levees in the year 2005.

We support: Goal 1 - Utilize relevant information to develop flood protection measures that protect life and property and enhance fish and wildlife habitat.

We appreciate the use of the **Flood Frequency** – Probability, expressed as a percentage, that a flood of a given size will be equaled or exceeded in any given year. The flood that has a one percent probability (1 in 100) of being equaled or exceeded in any given year is often referred to as the 100-year flood. Similarly, the floods that have a two percent probability (1 in 50) and a 0.2 percent (1 in 500) of being equaled or exceeded in any year are referred to as the 50-year flood and the 500-year flood, respectively (FEMA, 1999).

We see a reference to; “Areas along the Sacramento River and its accompanying riparian corridor are rich with plant and animal habitat.” There is no comment or assessment of Butte Creek's riparian vegetation.

We support the Bridge Design recommendation - Action F.

Namely that: “additional hydraulic analyses are underway as part of the Butte Creek Watershed FMP to evaluate the adequacy of the bridges on Butte Creek, propose more efficient hydraulic design, identify pier protection measures, and perform preliminary cost estimates. The Butte County Department of Development Services, the Butte County Department of Public Works, or the Butte County Office of Emergency Services should conduct an inventory of bridges needing repair/replacement; redesign and reconstruct Butte County bridges to accommodate reasonably anticipated water depths and flow, and provide planning, design, and cost analysis and guidance in the Butte County General Plan...”

All bridges built or rebuilt should be required to pass the largest of flood debris. There is no other pro-active solution to this serious flooding problem. Cutting debris after the fact is a waste of resources and will do nothing to prevent new large woody debris from being incorporated in floodwaters in the future. Dumping or leaving of vehicles or other large objects in the floodplain should be prohibited and enforced.

We support *Action I. Public Education And Awareness Programs*

Public understanding is invaluable and helps build support for the expenses of funding these actions as a whole.

We support: Floodplain Mapping – Integrating Awareness Floodplain maps as advisory tools. “The use of DWR’s Awareness Floodplain maps in the Butte County Department of Development Services and Planning Department to assist in the planning process and developing floodplain management policies is considered a relatively inexpensive mitigation measure, as the maps are available free and online. Providing the maps online as a link on the Butte County and BCWC websites, incorporating the maps into the BCWC database, and using the maps when determining and implementing flood mitigation measures can be integrated into the daily Butte County operations and implementation costs would be relatively low.”

Although this mitigation measure is recommended, it has not been developed into an Action Plan. It should be. We also believe this mapping should also be used to develop land use regulations such as an overlay zone that prohibits development in flood hazard areas especially in Butte Creek Canyon, and Butte Meadows.

Our copy lacks Appendix G, which makes it impossible to assess cost benefit evaluations. There is no assessment of the benefits and costs of any levee setback.

We support the recommendation for: Building Elevation

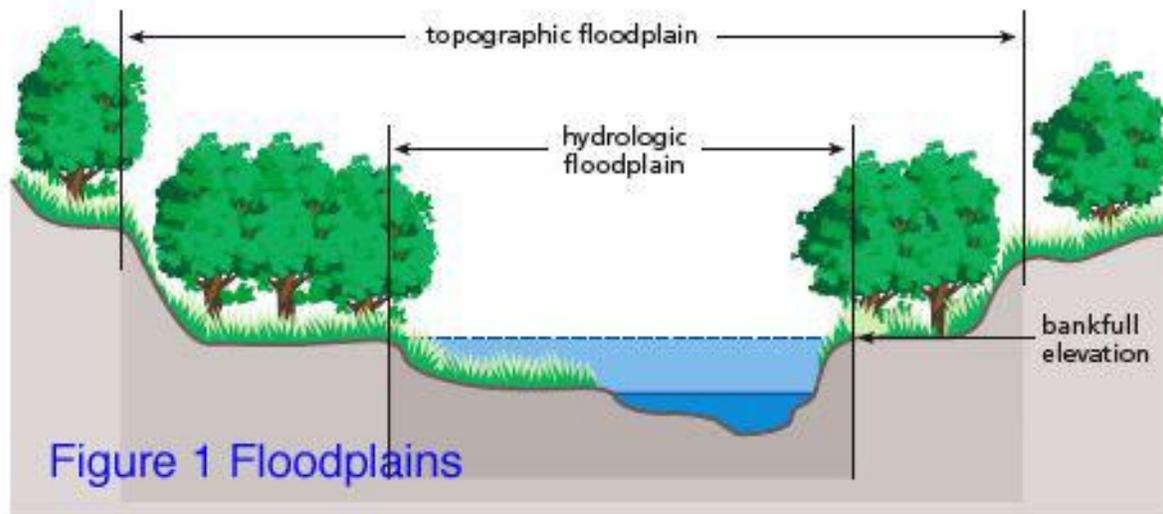
“Incorporating standards into the building code that exceed the NFIP standards and current Butte County standards for all improved, repaired, or new buildings has a relatively low implementation cost and is recommended in this Butte Creek Watershed FMP”. The cost of raising new buildings an extra foot or more is insignificant compared to the potential savings.

We’re concerned about catastrophic hillside failures in the Canyon and forested watershed area. Therefore: Limit road building in areas where hillsides may fail. Build all roads to standards to limit run-off discharge by limiting inside ditches and culverts in favor of out sloped roads. Protect all hillsides from run-off discharge. Develop early warning system to identify failures and protect downstream residents.

Potential Levee failure concern can also be addressed by the use of the floodplain excavation technique, combined as needed with limited moving of levees to increase safety factors while improving habitat, maintaining the creek bottom, and meander characteristics of the creek.

For example where farming occurs within the levees we know from experience on the Sacramento River that agricultural operations that occur within the 2.5 year floodplain are uneconomical due to frequent damage by high water events. These properties on the river have typically sold for restoration for the reason. Floodplain excavation can help reduce flooding frequency while allowing for riparian vegetation,

In studies the creation of a two-stage channel and distant flood banks increased in-stream aquatic macrophyte richness above that of the control due to the creation of greater habitat diversity. The maintenance of floodplain backwaters is vital for the maintenance of invertebrate communities in the floodplain. Invertebrates are vital for fish populations.



### **Figure 1 Functional stream floodplains**

From: Stream Corridor Restoration: principles, Processes, and Practices, prepared by a Federal Interagency Team and Peer reviewed

The invertebrate community reflects the dynamics of the floodplain.

In addition, changes in water level cause substrate movement and erosion of gravel beds, which reduce fish spawning areas and therefore recruitment

Sewage ponds at Spanish Gardens not mentioned as endangered by channel migration.

No mention of pinch points on the floodway such as the reduction of cross sectional area as levees neck down at the Midway Bridge.

We are shocked to see a proposal to reduce flows to Little Chico Creek to 100 CFS. This will tend to effectively eliminate nearly all habitat values on Little Chico Creek for aquatic species. How was the assessment of roughness (Manning's "N") on Little Chico performed? Were existing FEMA cross sections used?

In this Case we recommend:

Regarding Vegetative clearing on Little Chico Creek to improve conveyance we suggest:

1. Careful modeling and calculation of an achievable Manning's coefficient first.
2. Non-native removal tree removal and killing (catalpa tend to grow right in the bankfull channel) also ailanthus, figs, and hackberry; and replanting with native trees.
3. Arundo and blackberry removal (both impair bank stability) and replanting with native shrubs.
4. Careful and selective removal or trimming of native trees and large woody debris on an as needed basis only in the fall after leaf drop and to ISA standards.
4. Maintain a tree canopy to decrease under story growth

5. Absolute prohibition of buildings on or near stream banks (County). This would include no reconstruction or remodeling of old buildings. (Move buildings off the creek bank on one side or the other or both where possible.)
6. Careful planning and modeling of new developments that drain into Little Chico Creek - no net increase in peak flows (some of this is being done now).
7. A long term plan to address the issue (with the City of Chico and County) which can include floodplain excavation as Streaminders is doing with our California Urban streams grant with Butte County on Big Chico Creek (perhaps a MOU and a HCP).
8. An ongoing program of purchasing properties along the creek as they become available and application of an overlay zone which includes CC&R's for the above and setbacks, with reselling of the remainder of the property as appropriate.
  - A. From Ann Riley's book (Riley, 1998; Restoring Streams in Cities):
    2. Typical impacts of conventional clearing can be increased erosion and widening of the channel, loss of riparian buffer to trap nutrients and sediment.
    3. Maintenance must be consistent to achieve benefits
    4. Costs can be decreased and Community support increased by the development of a routine maintenance program.
    5. Successful current projects use an interdisciplinary team to survey the stream and design a plan compatible with fish and wildlife, and hydraulic needs.
    6. Biologists are suggesting that it is better to clear trees from the floodplain rather than trees bordering the bankfull channel.
    7. Other clearing guidelines include:
      - A. Do not remove embedded logs or snags, logs parallel to the bank, or logs that do not significantly impair flow.
      - B. Leave small debris accumulations unless trapped on logs being removed.
      - C. Restrict machinery and vehicle access to selected locations and along lines perpendicular to the stream.
      - D. Cut logs or trees into smaller pieces by hand so that they can be dragged out by cables rather than using tractors in the creek.
      - E. Mark all materials to be removed before the job begins.

It would be valuable to set standards for bank protection. For example new riprap @ Oro-Chico bridge extends out into and decreases the available cross sectional flow area of the flood way.

Reach by reach evaluation: Several of these comments are based on the "Geomorphic Assessment of Butte Creek, Butte County, California" (Williams J.G., Kondolf and Ginney Feb, 2002). The BCFMP The document cites this study but it is difficult to see its findings anywhere in the document.

In the 99-Oro-Chico bridge reach the stream is incised into the Red Bluff formation. The presence of boulders is also evidence of the high shear forces that result in few spawning gravels. This is evidence that this reach lacks capacity. The lack of spawning gravel is a significant deficiency in a reach that is included in primary Fall Run spawning habitat (Butte Creek ECR, 2000).

The Oro-Chico Bridge – Durham Dayton highway bridge reach. Riparian vegetation consists of a “narrow shrubby fringe”. “Gravel is swept through” downstream of the 85,000 feet the reach is underlain by Modesto Formation. It lacks a significant hyporeic zone.

Durham Dayton Highway Bridge – Big Bend reach. The channel is incised into the durapan. Also the hardpan is increasingly exposed going downstream. Again hyporeic habitat is lacking.

Big Bend – Midway Bridge reach. The channel is clearly oversized in that researchers observed a 9000 CFS flow contained within the channel. The study calculates the bankfull event (generally regarded as the main channel forming flow to be between 4651-6444 CFS. Therefore the channel should be sized to contain this amount of flow. The velocities thus generated in the existing channel will scour out gravels, fish, and habitat features. See Appendix?? Channel Evolution Model. There are some alternate bars upstream of the bridge formed by its backwater effect however.

Midway Bridge – Durnell Road bridge reach this is a sediment transport reach with the right bank levee set back along the historical channel. It supports a “narrow fringe of riparian trees”. There is very little gravel.

Durnell Road Bridge – Western Canal siphon reach The channel is scoured to hardpan for 2/3rds of the reach. At station 45,500 gravel begins. The channel is incised. Thus channel complexity is poor and hydraulic flood plain access is eliminated.

Western Canal siphon – end of levees reach The channel is scoured to hardpan for the entire reach. With accumulations of fine gravel, sand, silt and clay on the surface. Again lacking a hyporeic zone of any extent. Has been channelized “to make room for rice cultivation”.

End of levees reach Scoured to hardpan in the upper portion of the reach and grading to silt/clay mud at highway 162. Some gravel is present in the channel.

In general the stream in these reaches lacks gravel and significant riparian vegetation. This is very poor habitat conditions for fisheries. From Highway 99 downstream the reaches are in class 2 , 3, or 4 shown in: ***Channel Evolution Model Figure 2*** (attachment). These classes provide low quality habitat due to channel features and dimensions.

Restricting the floodway to a narrow stream corridor does not allow the full horizontal diversity of floodplains, nor does it fully accommodate functions that occur during flood events, such as use of the floodplain by aquatic species, dissipation of significant amounts of energy, nutrient transformation, and invertebrate activities which all can occur adjacent to the stream. For good habitat, it is important to manage and/or create what we call the hydraulic floodplain as well as the channel. The design needs to accommodate some channel migration or it will result in a corridor that cannot house dynamic processes such as sediment transport and salmonid habitat. It is most important is to maintain sediment transport at a rate as near as possible to pre-project levels.

Further applicable comments in this section are summarized from: Stream Corridor Restoration developed by a Federal Interagency Team. This is not an extensive or academic treatment of the subject. It is intended to summarize some significant concerns given time restrictions.

Goals for vegetation management should include:

1. Inventory existing vegetation
2. Preserve existing vegetation (save existing and transplant wherever possible)
3. Restore plant community both under and overstory
4. Consider structure of the edge of the riparian community
5. Utilize Biotechnical engineering for slope stabilization, erosion reduction, and vegetation establishment

Good management includes Riparian Buffer Strips. Managers of riparian systems have long recognized the importance of buffer strips, for the following reasons (USACE 1991):

1. Provide shade that reduces water temperature.
2. Cause deposition of (i.e., filter) sediments and other contaminants.
3. Reduce nutrient loads of streams.
4. Stabilize stream banks with vegetation.
5. Reduce erosion caused by uncontrolled runoff.
6. Provide riparian wildlife habitat.
7. Protect fish habitat.
8. Maintain aquatic food webs.
9. Provide a visually appealing greenbelt.
10. NRCS programs provide cost share for construction and maintenance of Buffer strips.

See also: [http://www.calwaterfowl.org/incentive\\_programs.htm](http://www.calwaterfowl.org/incentive_programs.htm)

#### (CRP - Conservation Reserve Program

The existing CRP is still linked to commodity cropland, but has a more flexible rental cap. CRP is based on ten to 15-year contracts to set aside sensitive croplands in grass and trees. CRP targets erodible lands, filter strips and buffers for water and air quality, and wildlife benefits.

#### CREP- CRP Enhancement Program

CREP is an existing program that takes a multiple landowner, regional approach (e.g., Delta) to implementation of CRP agreements. Like all Farm Bill conservation programs, CREP is voluntary. Because of its targeted regional approach, CREP offers greater flexibility for the unique circumstances of an area than under individual non-CRP contracts. A CREP approach also offers greater opportunities for the provision of regulatory relief under the federal Endangered Species Act for participating growers. CREP is intended to integrate state and federal conservation assistance, and therefore, requires a state match and the endorsement of the affected state's Governor.

#### WRP - Wetland Reserve Program

Wetland Reserve Program (WRP): The Natural Resource Conservation Service (NRCS) administers this program, which provides landowners financial incentive to retire farmland and restore it to wetlands. To be eligible for WRP the property must have hydric (wetland) soils and an agricultural history. WRP offers landowners three options: permanent easements, 30-year easements, and 10-year restoration agreements. Permanent easements purchase development rights in perpetuity and the payment will be the lesser of the three: 1) the agricultural value of the land, 2) an established payment

cap (\$2,000/acre) or 3) an amount offered by the landowner. In addition to the permanent easement payment, the NRCS pays 100% of the cost of restoring easement lands back to wetlands. The 30-year easement buys the property development rights for 30 years and pays 75% of the permanent easements value and 75% of the restoration costs. The 10-year restoration agreement does not put an easement on the property; instead it pays 75% of the cost of restoration and requires that the restored wetland be maintained for a minimum of ten years. Undeveloped recreation activities, such as hunting and fishing, are allowed and other uses such as livestock grazing can be negotiated. For further information contact your county NRCS/ USDA office. WRP targets poor quality, flood-prone soils. Because of this, and because WRP permits hunting, a WRP agreement can often improve a grower's income as well as the local tax base.)

Standards for floodway design include:

1. Evaluate stream reaches for stability while developing a restoration or flood management plan
2. Describe physical aspects of the watershed and characterize its hydrologic response.
3. Considering reach and associated constraints, select a preliminary right-of-way for the restored stream channel corridor and compute the valley length and valley slope.
4. Determine the approximate bed material size distribution for the new channel (a sediment rating curve must be developed).
5. Conduct a hydrologic and hydraulic analysis to select a design discharge or range of discharges (determine what discharge controls channel size).
6. Predict stable planform type (straight, meandering, or braided). The planform aspects of rivers are the most difficult to predict, a sentiment echoed by USACE (1994). One method is to use regional hydraulic geometry.
7. It is also necessary to include funding for maintenance, which includes ongoing plantings and monitoring etc.
8. Other expenses will include mitigation for elderberries and other endangered and threatened specie impacts.

## Conclusion

Perhaps the most important recommendation of this plan would be to reinforce local land use regulations that would diminish the risk of flooding to the residents of Butte County. Quite simply, the value of an unconstrained, free flowing river that produces incredible runs of critically important salmonids is incalculable. Development should be prohibited, stream corridors should be protected and allowed to return to native vegetation, and wherever possible, homes and businesses should be relocated to give the river room to meander.

Flooding issues outside the immediate floodplain are a concern but are far too extensive to be included in this project. Low impact development that eliminates runoff at the source could be the ideal for all our watersheds and would provide the greatest recharge of our aquifers. This, however, is a more complicated land use issue that is beyond the scope of this floodplain project. In general mitigating the effects of floods can be best served by protecting and restoring the natural function of floodplains, with their ability to hold up floodwaters and reduce the flood pulse. The effects of droughts can similarly be mitigated through the increased retention time of water in functioning floodplain wetlands.

We hereby submit our comments to Butte County and the consulting engineers working on the FMP. In the management of the flood plain, it is important to consider the essential aquatic habitat of Butte Creek, which supports the exceptional, runs of endangered spring run Chinook salmon and steelhead. A search for the words salmon or salmonid in the BCFMP document shows that they appear zero times. Nevertheless any proposed project will have to address impacts and benefits to salmon on Butte Creek. Activities that protect, restore or enhance aquatic habitat would be much more acceptable, and those that would be detrimental to this habitat would likely be illegal and certainly more difficult, and thus expensive under federal and state endangered species laws. Flood management planning and projects that are in harmony with the stream system from headwaters to the river will result in lower costs, more safety, and a better environment. An example of this is the Napa River living river plan developed and funded by the citizens of Napa County (Appendix 5).

Sincerely,

**Error! Reference source not found.** for Streaminders and BCCWA Tuesday, February 22, 2005

### ***Appendix 1 CalFed language:***

**FLOOD MANAGEMENT AS ECOSYSTEM TOOL.** The current approach is to control floods using dams, levees, bypass channels, and channel clearing. This approach is maintenance-intensive, and the underlying cause of much of the habitat decline in the Bay-Delta system since 1850. Not only has flood control directly affected ecological resources, confining flows between closely spaced levees also concentrates flow and increases flood problems downstream. Emergency flood repairs are stressful to local communities and resources and fish and wildlife and often result in degraded habitat conditions. An alternative approach is to manage floods, recognizing that they will occur, they cannot be controlled entirely, and have many ecological benefits.

Allowing rivers access to more of their floodplains actually reduces the danger of levee failure because it provides more flood storage and relieves pressure on remaining levees. Valley-wide solutions for comprehensive flood management are essential to ensure public safety and to restore natural, ecological functioning of river channels and floodplains. Integrating ecosystem restoration with the Army Corps of Engineers' and the California Reclamation Board's Sacramento and San Joaquin River Basins Comprehensive Study of Central Valley flood management can help redesign flood control infrastructure to accommodate more capacity for habitat while reducing the risks of flood damage.

From the CalFed website.

## ***Appendix 2 COE Stream Restoration authority***

The Corps has two types of authority to become involved in a stream restoration endeavor: The Section 1135 program and the General Investigations program. Either authority is required to have a "local sponsor" for a project, such as a city, state (agency), or county. However, we can also use non-traditional sponsors (such as Trout Unlimited) for these projects designed to benefit the environment.

Sponsors are required to handle all real estate concerns associated with a project, and must pay for part of the project (as outlined below). Costs to obtain these items can be credited toward the sponsors cost share. The local sponsor will usually be required to perform all needed operation & maintenance of a project.

Projects under the Corps environmental restoration do not have to meet a cost/benefit criteria (as do traditional Corps projects), but must instead show benefits commensurate with the dollars expended, or be done to benefit a species listed under the Endangered Species Act.

**Section 1135** is an authority where the Corps can modify existing Corps projects to benefit the environment. Examples of exiting Corps projects include Lower Granite Dam, levee systems in Jackson Hole, WY, and "clearing & snagging" projects done by the District in past years. However, the original purpose of the Corps project cannot be compromised by completion of the 1135 project.

Cost sharing is 75 percent Federal, 25 percent local sponsor. This includes all costs of the project: Design, plans & specifications, and construction. Volunteer services can used in the project, and will be used to lower the overall cost of the cost of the project for both entities.

Projects can take from 1-4 years to complete, from the beginning of the first contact to completion of construction.

## ***Appendix 4 Models of planning and management***

### Prevalent existing land use planning and management

- Compliance with regulations and financial inducements
- Compromise through adversarial negotiation and litigation
- Single issue or single parcel short term planning
- Regulation based mitigation and monitoring

*Results in a regulated, externally driven program that relies on mitigation and enforcement of selected “right answers.”*

### Stewardship based planning and management

- Commitment to watershed protection and enhancement
- Interest based solutions
- Integrated long term resource planning and management
- Cooperative, voluntary management and monitoring

*Results in self sustaining, internally driven quality management*

*From: Dennis Bowker, CalFed Partnership Workshop 2004*

## **Appendix 5**

Floodplain and Watershed Management  
in the Napa Valley

Fall 1998 Floodplain Management Association Conference  
September 18, 1998, In Sacramento, CA

Author and presenter: Graham S. Wadsworth, Civil Engineer IV, City of Napa,  
Public Works Department, P.O. Box 660, Napa, CA 94559-0660  
Phone: 707-257-9520 extension 7308, Facsimile: 707-257-9522,  
E-mail: GWadswor@cityofnapa.org

Abstract

Introduction

History of Flooding

The Community Coalition

Flood Protection & Watershed Management Plan

Conclusion

References

Abstract

The City of Napa has suffered from 27 floods between 1862 and 1997, with the largest flood occurring on February 18, 1986. Between 1961 and 1997, Napa County residents suffered \$542 million in property damage. After the 1986 Flood, the City made an ambitious effort to reduce damages from floods, and after the 1995 floods, the effort became the top priority throughout Napa County.

In January 1996, the Friends of the Napa River, Napa Valley Economic Development Corporation, Napa County Flood Control District and Corps of Engineers invited residents, businesses, local government, and numerous resource agencies to become part of a Community Coalition to create a flood protection project that will be built through the City of Napa. The Coalition established goals of 100-year flood protection, an environmentally restored, "living" Napa River, enhanced opportunities for economic development, a local financing plan that the community could support and a plan that addressed the entire watershed countywide.

With the plan, a campaign, organized by the Citizens for Napa River Flood Management, was launched to fund the local share of the project. Other funding sources have been sought to fund countywide floodplain and watershed management and reduce the local share of the project costs. On March 3, 1998, the Napa County voters approved a one-half cent sales tax, known as Measure "A". Measure "A" will also fund flood protection, drainage improvements, dam safety and watershed management projects for each community in the County and in the unincorporated area of the County.

There are many aspects of floodplain management included in the Napa River Flood Protection Project. Projects on the Upper Mississippi River, South Platte River in Colorado, Red River of the North, Kissimmee River in Florida and Napa River show that the goal of flood control is being replaced by flood management and hazard mitigation.

I Introduction

On March 3, 1998, the Napa County voters approved a one-half cent sales tax, known as Measure "A", which will fund flood protection and watershed management projects throughout Napa County. The Napa River Flood Protection Project (Project), which is a \$170 million, seven mile long, channel-widening project, will receive two-thirds of the funding from Measure "A". The Project contains many aspects of floodplain and watershed management, and this paper will provide a list

of potential funding sources, participants and practices used on the Project. Much of this paper is taken from the "Citizen's Guide to the City of Napa, Napa River and Napa Creek Flood Protection Project".

## II History of Flooding

### A. Damages

Napa City was founded in 1847, where the Napa River flattens out into the San Pablo Bay estuary which is a desirable geographical location that is unfortunately somewhat prone to flooding. There is a 300 square mile watershed above the City of Napa. Between 1862 and 1997, the City of Napa has suffered from 27 floods with the largest flood occurring on February 18, 1986.

Between 1961 and 1997, Napa County residents have suffered an estimated \$542 million in property damage. This does not include the cost of lost tourism, delayed projects, environmental damage, deaths, pain and suffering. Napa County has the third most flood damage claims in California and probably the highest per capita.

During the 1986 flood, 20 inches of rain fell within a 48-hour period near Napa at a gage with an annual average rainfall of 36 inches. There were three deaths, 250 homes destroyed, 2500 homes damaged and 5000 people evacuated from their homes. There are about 2500 properties in the floodplain in the City of Napa.

During March 1995, the City suffered from a flood that was nearly as large as the 1986 flood. During January 1997, the City suffered from a ten-year return period flood. This winter, Napa received 200 percent of the normal rainfall, but there were breaks between the storms, so there was only minor flooding, which occurred on February 3, 1998.

### A. Floodplain Management

In the 1930's, the US Army Corps of Engineers (Corps) began dredging and straightening the Napa River for navigation and flood control. In 1965, Congress authorized the development of a detailed project proposal for flood control and in 1975 the Corps of Engineers submitted the first project proposal. Napa County voters rejected the proposal, because the project was not environmentally sensitive.

After the 1986 Flood, the City made an ambitious effort to reduce damages from floods. The City promoted a flood protection project and participated in the creation of the "Napa River Watershed Owners Manual", but floodplain management and watershed management were considered separate issues. The Owners Manual set goals and practices for improving water quality and habitat in the watershed and not flood protection.

The City participates in the National Flood Insurance Program, created an Emergency Plan based on the Standard Emergency Management System, installed ALERT rainfall and stream monitoring gages, participated in Flood Awareness Week, applied for FEMA Hazard Mitigation Grant Program funds, and hired a consultant to prepare a Storm Drainage Master Plan to address localized flooding and water quality improvements.

The City and County use the NWS HydroMet program to watch the rise in the streams and the Storm Watch program to get a visual interpolation of the rainfall intensities. The City has also prepared sandbag demonstrations, the "Citizen's Guide to Flooding and Flood Recovery", and the "Street Closure and Barricade Map" that the City uses to close streets in phases and detour traffic. Community outreach in the newspaper, on the radio and on the local access cable TV channel has also been important.

In January 1996, the Friends of the Napa River, Napa Valley Economic Development Corporation, Napa County Flood Control and Water Conservation District (NCFWCWD) and Corps of Engineers invited residents, businesses, local government, and numerous resource agencies to become part of a Community Coalition to create a flood protection project that will be built through the City of Napa. The Corps of Engineers is the federal sponsor of the Project and the Napa County

Flood Control District is the local sponsor. The Coalition quickly changed the project from flood control to flood management, recognizing the diverse array of needs and values affected by river flooding, and addressed flood protection and environmental restoration needs throughout the County.

### III The Community Coalition

#### A. Participants

Many agencies, groups and individuals were involved in the Coalition and each had their own interests and culture. To have these people even talking to each other, much less cooperating to create a flood protection project, was an impressive part of the Project.

Some of the agencies involved in the creation of the plan include the Napa County Resource Conservation District, Regional Water Quality Control Board, California Department of Fish and Game, State Lands Commission, Natural Resource Conservation Service, U.S. Fish and Wildlife Service, U.S. Environmental Protection Agency, National Marine Fisheries Service, and the U.S. Army Corps of Engineers, Napa County and all of the Cities in the County.

Some of the groups involved in the creation of the plan include the Friends of the Napa River, Napa Valley Economic Development Corporation, Napa Chamber of Commerce, Sierra Club, Napa County Vintners Association, Napa County Landmarks, Napa County Land Trust, Napa-Solono Building Trades Council, Napa Valley Conference and Visitors Bureau, Napa Downtown Merchants, Napa County Farm Bureau, Suscol Council, Agricultural Commission, and Napa Valley Grape Growers Association. Local architects and business owners also provided valuable input.

Some of the outside experts involved with the creation of the Project included Phillip Williams of Phillip Williams and Associates, Luna Leopold of UC Berkeley, Woody Trihey of Entrix, and Ann Riley of the Waterways Restoration Institute.

The Community Coalition was instructed in geomorphology, hydrology, real estate acquisitions, financing, aesthetics, and the definition of a living river strategy. Using consensus building, a plan was created with floodplain and marshplain terraces, bioengineered bank stabilization, wetland creation, bridge replacements, a flood bypass, river trail and architectural drawings.

#### A. Goals

The Coalition established goals of 100-year flood protection, an environmentally restored, "living" Napa River, enhanced opportunities for economic development, a local financing plan that the community could support, and a plan that addressed the entire watershed countywide.

A "living Napa River" would convey variable flows and restore habitat in the floodplain, balance sediment input with sediment transport, provide natural fish and wildlife habitat, maintain high water quality and supply, offer improved recreation opportunities, maintain its aesthetic qualities, and generally enhance the human environment. By using the living river strategy, the project is self-mitigating and will create about 500 acres of wetland and marshland habitat by removing levees and returning tidal influence to historic baylands.

#### B. Design

It was important to get early input and support from the resource agencies, the public and design engineers. The public wanted to be heard, the resource agencies wanted to provide input early in the design, and the engineers provided constructability evaluations.

The Mike 11 computer program, which was created by the Danish Hydraulic Institute, was used to study flood flows on the floodplain and marsh plain terraces, set terrace elevations and widths present the project visually to the Coalition, and evaluate sedimentation rates. The Mike 11 Modeling System is a dynamic, one-dimensional hydraulic model that can show the flood moving through the project in plan and profile views. Mike 11 is a software package for the simulation of flows, water quality and sediment transport in estuaries, rivers, and channels.

The Corps of Engineers blended engineering and ecology to design the \$170 million, seven mile long, channel-widening project. The Corps mostly used HEC-2 to set the height of the floodwalls and levees, but these were usually only about three to four feet high. The Corps did have to use the two-dimensional DWOPER program to calculate the water surface elevations through the big bends in the "oxbow". The Corps studied the interior drainage on the land side of the floodwall, and levees so that they could size the pumps that would push the localized runoff into the River during high flows.

The Corps, with very active participation of the NCFWCWD and City of Napa, also prepared the environmental document and wrote a Citizen's Guide to explain the project to the layperson, prepared a video, had photo renderings made, and held the public meeting. The plan was reviewed and revised by the public, resource agencies and City and County staff. The all mighty benefit-to-cost ratio was close to unity. Even though the Corps assumed that the principal benefit would be the reduction in flood insurance, there are more benefits to this project.

Residents, business owners, and City staff wanted flood protection, but they were concerned with a six-mile long swath being cut through the heart of the City, the removal of 109 buildings, and the disruption to traffic and businesses during construction. City staff met with property owners, created a traffic-phasing plan and will create design principals for the aesthetics of the project.

#### IV The Flood Protection and Watershed Management Plan

##### A. The Campaign

With the draft plan and environmental document, a campaign, organized by the Citizens for Napa River Flood Management, was launched to fund the local share of the project. Voter polls showed that a 20-year, one-half cent sales tax was more achievable than a benefit assessment or an Ad Valorem property tax. When the Board of Supervisors decided to have a special election requiring a two-thirds majority, everyone knew that they had a big job ahead of them.

The campaign, for a ballot initiative known as Measure "A", promoted the benefits of avoiding lost business revenue, savings in annual flood insurance, property value enhancement, and improved health and safety by increasing access to the urban areas of Napa. People were told that for every \$1 spent in flood protection, Napa City residents would receive a projected \$7 in savings on property damage.

Wineries that depended on tourism contributed to the \$400,000 campaign, even though one-third of the funding from the one-half cent sales tax will come from tourists. The Corps and NCFWCWD spent \$450,000 on the Community Coalition, so the total cost of the coalition process and campaign approached \$1 million, which does not include the 7,000 person hours that the public, resource agencies and City staff contributed. The Citizen's Guide to the Project, a list of projects for each community in the County, the creation of oversight committees, 80 community outreach presentations, over 200 volunteers getting the word out, phone calls on election day, letters to the editors, support by the local media, a strong national economy and even El Nino all influenced a two-thirds vote of approval.

Having the campaign and election during the flood season took advantage of everyone's piqued awareness of the potential for flooding. It took advantage of the "hydro-il-logical" cycle of complaining that nothing is being done about flooding during a flood and forgetting about flooding a short time after the flood. It was also important to emphasize the personal suffering by people impacted by floods and the video titled "Race with the River" accomplished this. The video was shown at presentations to acquaint people with the Napa River Flood Protection Project and promote Measure "A".

On March 3, 1998, the Napa County voters approved a one-half cent sales tax to fund the local share of the project through the City of Napa and numerous flood protection and watershed

management projects throughout the County. The polling was proven correct because 300 out of 27,000 votes cast decided the election.

A. Other funding sources

Other funding sources have been sought to fund countywide floodplain and watershed management and reduce the local share of the project costs. This "layering" of funds from many sources is critical to a comprehensive Flood Management Plan in a community like the Napa Valley, which has huge flooding problems but a population of only 120,000 people.

A Storm Water System Service Fee was adopted by the City Council, which provides an annual \$350,000 dedicated funding source for storm drainage construction, maintenance, grant matching funds and water quality improvements. The Flood Control District adopted a similar watershed management assessment for channel maintenance, bank stabilization cost share program, water quality compliance, studies, and grant matching.

In 1997, the Governor's Office of Emergency Services awarded the City \$7 million in FEMA Hazard Mitigation Grant Program. Napa County and the Town of Yountville received FEMA funds for home elevations and the Friends of the Napa River received FEMA funds to construct door dams in Downtown Napa. The Department of Water Resources also provided an Urban Streams Restoration Program grant for the purchase of a non-residential parcel.

The funds will reduce the local share of the Flood Protection Project and allow the early acquisition of 90 mobile home park units, the early acquisition of seven homes on Napa Creek, the construction of drainage improvements to protect areas not protected by the Flood Protection Project, and the elevation of homes that were not protected by the Project.

The City has applied for \$20 million in FHWA Highway Bridge Replacement and Rehabilitation funds to replace three of the bridges in the Project area. The Corps will be responsible for the design and construction of five of the thirteen bridges. Bridges and utilities account for 22 percent of the project costs.

The Flood Control District is receiving funding from the CalFed Bay-Delta Program, which is the largest ecosystem restoration program in the world. In 1996, California voters passed Proposition 204, which is a \$955 million bond for the state's share for safe, clean and reliable water projects. CalFed and Coastal Conservancy grants will be used to acquire land and remove levees. The removals will increase the River's flood flow carrying capacity and return tidal influence to diked historic baylands.

The potentially big funding source is the state subvention funds. If the state meets its obligation to fund 70 percent of the local share of flood control projects and pays for the six or so projects in front of the Napa Project, then the 20-year term of the sales tax will be reduced. Because of the budget surplus, the state is funding subventions for the first time in almost a decade, but funding is much less than the obligation. The 1998-99 State of California budget shows Napa receiving \$1.1 million.

B. The Project in the City of Napa

Congress must still adopt the environmental document and provide the federal funding, and the NCFCD Board must certify the environmental document. The City will prepare the schematic design of the downtown, replace six bridges, and construct the recreational elements of the project. The Flood Control District will acquire lands, relocate utilities, and maintain the project. The Corps will excavate 1.7 million cubic yards of soil, stabilize banks, and construct floodwalls, levees and pump stations. During construction, water quality, endangered species, traffic control, hazardous materials, archaeological remains, and tenant relocations will be of great concern.

Easements or full acquisitions will be required on 300 parcels. An incredible 32% of the Project costs are for land acquisition and only 9% are for levees and floodwalls. This shows the Project is giving the floodplain back to the River instead of just building floodwalls.

With the project, a performance-based maintenance and monitoring plan will be created to reduce unnecessary dredging and environmental damage. A watershed model using ALERT data to make flood forecasts and monitor water quality will be used to predict sedimentation rates and maintenance needs.

One operational issue will be to close floodgates across McKinstry Street during high flows because it will pass through the bypass. Under the Project Cooperation Agreement, the Flood Control District will be required to modify the Flood Preparedness Plan to have alarm settings on the gages and to close the flood gates.

#### C. Other Projects

Flood protection, drainage improvement and dam safety projects were proposed for each community in the County and in the unincorporated area of the County. For example, American Canyon will implement their Storm Drainage Master Plan, Yountville will protect its mobile home parks from regular flooding, St. Helena will construct flood management measures along the River, and Calistoga will stabilize Kimball Reservoir. These projects still have to be designed, reviewed and approved by the oversight committees, but the funding is in place.

#### D. Watershed Management

In terms of watershed management, land use practices must not negatively impact the 100-year protection. Various kinds of development, including the conversion of hillside forests to vineyard could increase the volume and timing of floods. Erosion could cause sedimentation and the reduction of flood carrying capacity. In 1968, Napa County voters passed an agricultural preserve with rural-urban limit lines around the cities. Napa County has an ordinance for hillside development and may need to create an ordinance to freeze the hydrology of the Project by not allowing the peak flow rate in Napa to increase.

The ordinance would require development to mitigate increases in runoff and sediment that would affect the Flood Protection Project. Detention is one solution to allowing future development in the watershed. Detention also has the added benefit of reducing sediment and pollutants.

The Resource Conservation District, which has received many grants from many agencies for their watershed management projects, was recently awarded a CalFed grant to fund a \$340,000 Watershed Stewardship workplan. The work plan will establish demonstration sites for watershed restoration techniques, fund data collection and modeling with the Mike 11 model, develop new stewardship groups, address system stress and report to US EPA and CalFed.

The RCD has an excellent working relationship with the wineries and landowners and has made people feel like they are not dealing with a bunch of regulators. The RCD has emphasized the importance of the soil to the wine, so the wineries have made an effort to not lose that soil. Erosion control measures have improved during the 1990's and dredging quantities in the River have been reduced.

Another advantage of watershed restoration is that it attenuates the flood peaks by slowing down the runoff and flattening out the hydrograph.

#### V Conclusion

The Coalition process was a slow and expensive process, but it paid off during the campaign and review of the environmental document. People tend to support something that they help create, and broad-based support from diverse groups was imperative to get the two-thirds vote. Additionally, the use of funding from many sources helps to reduce the local cost of the project to the residents, which makes the project more acceptable.

There are many aspects of floodplain management included in the Napa River Flood Protection Project - emergency planning, home elevations, property acquisitions, bridge replacements, channel modifications, set back levees, drainage improvements, ordinances, land use practices, and wetland creation. The Project succeeded by minimizing the disruption and alteration of river

habitat and maximizing the opportunities for environmental restoration and enhancement throughout the watershed.

Projects on the Upper Mississippi River, South Platte River in Colorado, Red River of the North Kissimmee River in Florida and Napa River show that the goal of flood control is being replaced by flood management and hazard mitigation. The Napa River Flood Protection Project has been successful because it incorporated watershed management practices and it is a comprehensive, multi-agency, mitigation plan using many funding sources to provide flood protection.

## VI References

U.S. Army Corps of Engineers and Napa County Flood Control and Water Conservation District. December 1997. "Citizen's Guide to the City of Napa, Napa River and Napa Creek Flood Protection Project." Sacramento District, Sacramento and Napa, CA.

Wadsworth, Graham. March 1998. "After-incident Action Report - Flood of February 3, 1998." City of Napa, Napa, CA.

Reviewers: Larry Pollard, Assistant Public Works Director, City of Napa

Cassandra Walker, Redevelopment Coordinator, City of Napa

Howard Siegel, Napa County Flood Control District

Rick Reinhardt, Corps of Engineers, Sacramento

Bob Zlomke, Napa County Resource Conservation District

Copy to: Michael O'Bryon, Public Works Director

Pam Means-Nigliazzo, City Clerk

Melodie Hilton, P.R. consultant

Heather Stanton, Flood Project Manager, NCFWCWD

Dave Dickson, Napa County Administration

Bob Peterson, NCFWCWD

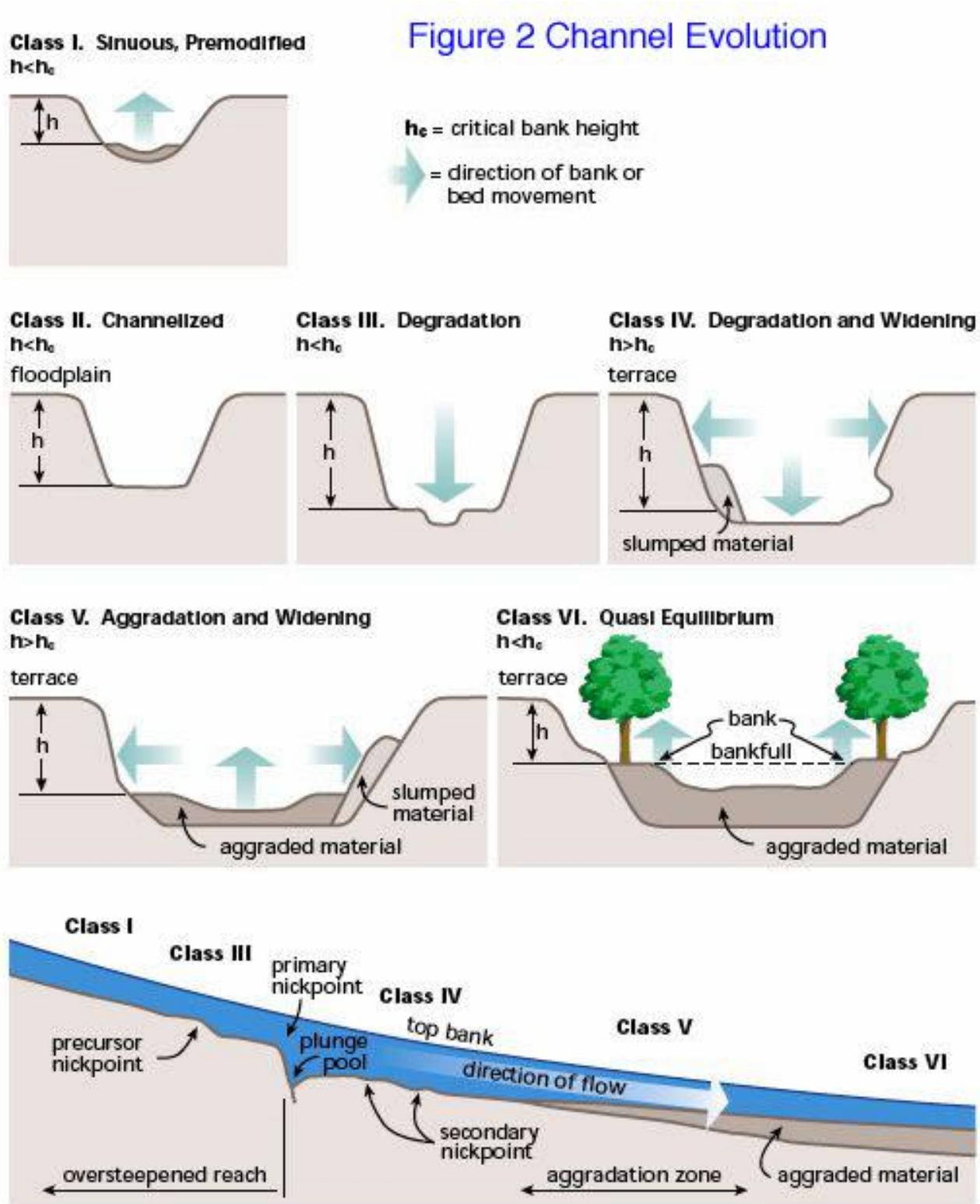
Myke Praul, NCFWCDC

Steve Kokotas, Napa Valley Economic Development Corp.

Moira Johnston-Block, Friends of the Napa River

Scoop/Author/File - Flood Protection Project

**Figure 2: Channel evolution model**



From: Stream Corridor Restoration: principles, Processes, and Practices, prepared by a Federal Interagency Team and Peer reviewed

## **Butte Creek Floodplain Management Plan (FMP)**

Comments submitted by Friends of Butte Creek, March 2004. Please submit to the formal record. For more information or clarification please contact Allen Harthorn at: [friends@buttecreek.org](mailto:friends@buttecreek.org)

The Friends of Butte Creek would like to submit our preliminary comments to Butte County and the consulting engineers working on the FMP. In the management of the floodplain, the utmost consideration for the essential aquatic habitat that Butte Creek has which supports the phenomenal runs of endangered spring run chinook salmon and steelhead, must be factored into the plan. Activities that protect, restore or enhance aquatic habitat would be acceptable and those that would be detrimental to this habitat would likely be illegal under federal and state endangered species laws.

### **General Comments**

All bridges built or rebuilt should be required to pass the largest of flood debris. There is no other pro-active solution to this serious flooding problem. Cutting debris after the fact is a waste of resources and will do nothing to prevent new large woody debris from being incorporated in floodwaters in the future. Dumping or leaving of vehicles or other large objects in the floodplain should be prohibited and enforced. Any attempts to divert floodwaters into existing diversions as has been suggested would be risky and dangerous and could entrain fish outside the creek banks. Diversions of several thousand cubic feet per second would be required to have any reasonable effect on Butte Creek when the flood flows are in excess of 25,000 cfs.

In addition, we are a little concerned that the floodplain of Little Chico Creek(LCC) seems to be the focus of a significant number of the interested parties in this project. Although LCC is a tributary of Butte Creek, their floodplains are only joined in the valley section beyond the levees. The bypass which diverts water above Chico does reduce the flow of LCC through Chico but it doesn't seem at all prudent to divert more water to Butte Creek when the levees are already strained at maximum capacity as demonstrated in 1997. It would seem that the floodplain of LCC is a completely separate issue that should be dealt with in consultation with the City of Chico and the Army Corp of Engineers who built the bypass. This does not seem like an issue that is a CALFED restoration priority.

Perhaps the most important aspect of this project would be to reinforce local land use regulations that would diminish the risk of flooding to the residents of Butte County. Quite simply, the value of a unconstrained, free flowing river that produces incredible runs of critically important salmonids is incalculable. Development should be prohibited, stream corridors should be protected and allowed to return to native vegetation, and wherever possible, homes and businesses should be relocated to give the river room to meander.

Flooding issues outside the immediate floodplain are a concern but are far too numerous to be considered in this project. Zero impact development that eliminates runoff would

be the ideal for all our watersheds and would provide the greatest recharge of our aquifers. This, however, is a much more complicated land use issue that is far beyond the scope of this floodplain project.

The following is a list of potential flooding issues identified by stream reach that would fall under the purview of this project:

### **Butte Meadows**

#### Causes

Development in the floodplain.

#### Solutions

Do not build in the floodplain

### **Butte Creek Canyon**

#### Causes

Development in the floodplain

Catastrophic hillside failures

#### Solutions

Do not build in the floodplain

Limit road building in areas where hillsides may fail. Build all roads to the highest standards for limiting run-off discharge by limiting inside ditches and culverts in favor of out sloped roads. Protect all hillsides from run-off discharge. Develop early warning system to identify failures and protect downstream residents.

### **Skyway to end of Levees**

#### Causes

Levee failure

Lack of adequate capacity

#### Solutions

Move the levees back

Increase channel capacity by removing areas of cemented gravels while maintaining the creek bottom and meander characteristics of the creek

### **Little Chico Creek**

#### Causes

Limited channel capacity

Development on the banks of creek

Non-native plants limiting capacity

#### Solutions

Move buildings off the creek bank on one side or the other or both where possible

Increase channel capacity by recreating a natural floodplain

Remove non-native plants, ie. Arundo Donax, Pampas Grass and others.

## **Comments on the Draft Butte Creek Floodplain Management Plan**

February 23, 2005

Submitted by Allen Harthorn, Director  
Friends of Butte Creek  
Butte Creek Watershed Advisory Committee member

To: William Johnson,  
Butte Creek Watershed Conservancy

Mr. Johnson,

Thank you for providing hard copies of the Draft Floodplain Management Plan, prepared by Wood Rodgers for the Butte Creek Watershed Conservancy and Butte County. This made it much easier to read and provide substantive comments. My comments will try to follow the outline of the document as closely as possible.

In Section 1 of the document it would appear that this project was not actually about managing the floodplain of Butte Creek as much as it was a creating a flood hazard mitigation plan. The first objective includes "enhance fish and wildlife habitat", yet there is no mention whatsoever of any kind of habitat enhancements. It is also apparent that the idea of the project for Butte Creek alone did not fit with the unstated goal of the project, i.e., reducing flood insurance rates, and the proponents began to immediately seek to incorporate the project into a Butte County floodplain management plan to satisfy FEMA requirements for lowering insurance rates. This was not part of the proposal nor the scope of work.

In Section 2 there is no mention of the Watershed Advisory Committee (WAC) meetings. Task 1b states that the WAC will be incorporated into the Management Plan with meetings on a monthly basis to ensure the program is initiated without conflict and a bi-monthly basis after that. The WAC was to develop preliminary goals and objectives for the stakeholder-driven process which is mentioned in Task 4a. The success criteria for Task 4 states, "The extent to which they are stakeholder-driven." Considering the fact that the Watershed Advisory Committee was never convened it would appear that this was not successful.

Although several members of the WAC attended early meetings including the April 24, 2003 meeting, there was no followup, no newsletters mailed to participants and apparently the attendance sheets were lost or not used as more than a year later, members of the Wood Rodgers team and Butte County solicited contact information from myself and others who had been in attendance. Friends of Butte Creek is listed as a contributing agency but we never received any mailed or email information without specifically asking for it. Despite recommendation to BCWC and Butte County to utilize existing Watershed Education Programs and teachers for Butte Creek, the sum total of the \$42,130 allocated for Task 2a was apparently spent developing a powerpoint presentation made to two fifth grade classes with misguided recommendations that flooding is "bad" and fires are "bad". In fact it is quite accepted in the resource management communities that both fires and floods are both essential elements of functioning ecosystems. There is no explanation or description of the process, the teachers involved, the resource people

involved or how the so called Public Education task 2a was developed. The powerpoint presentation was wholly inadequate “to inform this important segment of the public”. It did not describe the activities underway or the proposed activities. In short, it didn’t meet the success criteria.

### Section 3

The Flood Hazard areas described in the FMP are not consistent with the areas described in the Scope of Work. Despite assurances in the proposal and the Scope of Work that this was a watershed-wide effort, apparently everything upstream of the Honey Run Covered Bridge was eliminated from the program without any explanation. In looking at the identified hazard areas, the sum total of losses over the last 32 years was \$230,000; \$80,000 in Area 1, \$45,000 in Area 2, \$3,000 in Area 3, \$100,000 in Area 4, and \$2,000 in Area 6, it begs the question, “Why are we spending \$500,000+ when it would appear that there is a relatively minor problem with flood losses in the first place. Please provide the justifications for spending this large sum of money for questionable potential losses.

In flood hazard Area 4, the west side levee would not flood the properties on the east side of the diversion. There must be a mistake in the FEMA floodplain or the interpretation thereof.

The section on Wildland fires seems completely out of place. In fact there is not evidence in the watershed to suggest that any fire has ever increased the runoff or sedimentation of the creek. Although there is always the possibility that a fire may contribute something, runoff and sedimentation from road building, urbanization, timber harvest and other man-made causes is far more likely and it is not addressed in the draft document. Please see that these other sources of increased runoff and sedimentation are addressed.

Bridges and landslides are not well characterized. The problem at the bridges is not “excess debris”, it is inadequate clearance on the bridges. There is no way to control debris from flood events except on an open floodplain with lots of strainer trees. The resolution of this problem is adequately described later in the document in that the bridges should be rebuilt or modified to allow for debris passage in high flow events. Curiously, the majority of debris comes from landslides and the draft document only briefly describes seismic caused landslides. In the 1997 flood, there were two major landslides/bank failures that probably contributed the largest amount of damaging debris. One slide is located at the base of Center Gap road and contributed thousands of cubic yards of soil and rock and a whole hillside of trees all at once. Several residents described a wave coming down Butte Creek in the middle of the night. This was probably the result of this slide. The slide was probably exacerbated by a drainage pipe installed by Butte County that dumped significant runoff onto a steep, obviously unstable hillside. The other bank failure occurred at the upstream end of the Parrott/Phelan Diversion, and may have been caused by the wave previously described. This bank failure took out nearly 5 acres of mature trees, once again, all in a matter of minutes. These two events likely sent a tangle of vegetation downstream causing significant damage wherever it got caught up. In addition, a landslide in the Helltown area pushed the creek more than 100 feet into the opposite bank causing severe erosion at the base of several homes. This area and several other have the capability of depositing significant amounts of rock, soil and vegetation into the creek and potentially causing a temporary dam. This type of dam would likely break very quickly sending

a wave downstream far exceeding the peak flow in the creek. The potential destruction to streamside vegetation and soils, bridges, homes and businesses is not at all addressed in the draft document.

Table 3-6 indicates there are 1880 flood policies in Butte County. It would seem that the intent of this project is primarily to provide benefit to flood policy holders and nobody else. This does not seem to be ample justification to spend CALFED money intended to provide some solutions to the problems of the Bay-Delta ecosystem and was not the way the proposal or the Scope of Work characterized this program. Since there is no mention of enhancing fish or wildlife habitat it is apparent that this is a flood insurance reduction program, not floodplain management.

The mitigation identified seems to be inconsistent with the reality of the system. If the levees can handle a 500 Year flood event without topping the levees, then FEMA needs to do some recalculations as there is obviously not a problem with the levees. Any recommendation to raise the levees, at a cost of millions of dollars seems completely unjustified with the relatively inconsequential losses over the last 32 years of \$230,000. The mitigation for Area 3, avoiding development in the floodplain is about the only thing that seems reasonable and practical.

Hazard area 6 is clearly the focus of this program initiated by landowners along Little Chico Creek. There is three pages of discussions on this area as compared to less than one page for each of the others. It would certainly be prudent to remove overgrown non-native vegetation such as *Arundo donax* and Pampas Grass and where possible, widen the channel to allow for a more natural floodplain. Development encroachment is most of the problem and the policy of the city of Chico to buy properties along the creek is wise and should be greatly increased. Diverting extraordinary amounts of Little Chico Creek water to Butte Creek make little ecological sense.

Other mitigation described such as redesigning bridges and increasing the floor elevations for buildings in the floodplain seem prudent and practical. Also this has relatively low cost with long term benefits. The recognition of flood threats and preparing warning systems and evacuation plans is also very prudent.

On page 4-19, the Carpenter Ridge (CAR) CDEC gauges should be included as this gauge also provides temperature which helps determine the snow level. Since rain on snow events are the biggest cause of high flows this gauge provides important information about what is happening in the higher elevations of the watershed. A snow depth gauges should be established in Butte Meadows to provide a measure of the potential runoff in a rain on snow events such as January 1, 1997.

## Section 7

If the Butte Creek FMP doesn't meet FEMA criteria for reducing flood insurance rates, why was it funded? It seems that a Butte County Flood Hazard Program Plan would have been a more appropriate project to seek funding for. This simple fact indicates that this project was not really intended for any sort of wildlife or fish habitat improvement or sediment reduction as was claimed in the proposal.

## Section 8 - Actions

The only justifiable action out of this project is to make the Little Chico Creek floodplain more capable of handling high flow by eliminating non-native vegetation, redesigning the floodplain and keeping development from further encroaching on the creek.

Beyond that it seems that this project has taken money intended for ecosystem projects that would contribute to the improvement of the Bay-Delta ecosystem and used it to provide a mechanism to lower flood insurance rates for a few policy holders in the Butte Creek Watershed. The Friends of Butte Creek would suggest to the BCWC and to CALFED that this project be redefined, redesigned and carried out in a way that is much more stakeholder-driven and truly provides clear and measurable results for the Butte Creek Watershed, the significant salmon and steelhead species that inhabit the creek, and the greater Bay-Delta ecosystem.

Thank you for the opportunity to comment on this plan.

Sincerely,

Allen Harthorn, Director  
Friends of Butte Creek