The Butte Creek Watershed Conservancy

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Watershed Management Strategy

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Released for Public Review

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Acknowledgements

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Recognition also goes to the members of our Technical Advisory Committee for the expertise they shared in the creation of this document. We are especially indebted to the members of the Butte Creek Watershed Advisory Committee, who spent many hours reviewing and responding to drafts of this document. Their careful reading of the drafts, patience with the process, and avid commitment to the health and future of the Butte Creek Watershed have made the production of this document truly a community effort.

EXECUTIVE SUMMARY

The Watershed

Butte Creek originates in the Jonesville Basin, Lassen National Forest, at an elevation of 7,087 feet. Several small tributaries converge in the Butte Meadows Basin, an area characterized by a series of wide meadows and repeating series of pools and riffles. Butte Creek transitions from the Butte Meadows area approximately 25 miles through a canyon to the point where it enters the valley floor near Chico. Numerous small tributaries and springs enter the creek in the canyon area.

The valley section of Butte Creek is divided by the Sutter Buttes, located in the center of the Sacramento Valley. The upper portion is approximately 45 miles in length extending from Highway 99 near Chico to the point where Butte Creek first enters the Sacramento River at the Butte Slough Outfall Gates southeast of Colusa (see Figure 1). Historical records suggest that prior to levees being built along the Sacramento River, Butte Creek entered the River in this vicinity. Butte Creek in this reach is surrounded by agricultural lands, several state and federal wildlife areas, and is contained, at times, by a series of levees.

Butte Creek flows are regulated into the Sacramento River by the Butte Slough Outfall Gates to accommodate both flood flows and agricultural needs in the Sutter Bypass area. The Sutter Bypass section of Butte Creek is approximately 40 miles in length (see Figure 2). Butte Creek (now Butte Slough) splits into two channels, known as the East and West Borrow Canals, as it enters the Sutter Bypass near Highway 20. Generally, Butte Creek enters the Sacramento River via Sacramento Slough immediately upstream of the mouth of the Feather River near Verona.

The watershed's diverse and considerable resources of water, farmland, timber, and recreational opportunities enrich the lives of both its residents and visitors. However, growing demands on the resource base have created issues of concern to all.

The Process

The Butte Creek Watershed Conservancy (Conservancy), Watershed Advisory Committee (WAC), and Technical Advisory Committee (TAC) focus their efforts on the approximately 510,000-acre Butte Creek watershed from its headwaters to its historical confluence with the Sacramento River at Colusa (see attached map). Impetus for forming the Conservancy and developing the WAC and TAC stemmed from growing stakeholder concerns regarding issues that include, but are not limited to endangered species protection, water supply demands, land use practices, recreational impacts, fire and flood hazard, and urban development.

In an attempt to address these and other concerns, the Conservancy was formed in September 1995 to encourage the preservation and management of the Butte Creek watershed through watershed-wide cooperation between landowners, water users, recreational users, conservation groups, and local, state and federal agencies. The mission statement of the Conservancy reflects that dedication: "The Butte Creek Watershed Conservancy was established to protect, restore, and enhance the cultural, economic, and ecological heritage of the Butte Creek watershed through cooperative landowner action."

The Conservancy received non-profit 501(c)3 status in November of 1996. Shortly thereafter, the Conservancy prepared a Memorandum of Understanding (MOU) to create a Butte Creek Watershed Management Strategy. The MOU established a voluntary and cooperative agreement among 24 signatories to work together in a watershed planning process. It is the Conservancy's belief that

stakeholders working cooperatively have the greatest potential for streamlining resource management and minimizing conflict between landowners, water users, government agencies, and conservation groups.

Another effort has been undertaken in the lower portion of Butte Creek - The Lower Butte Creek Project. Stakeholders working with Ducks Unlimited Inc., Jones & Stokes, Inc., and California Waterfowl Association have focused on developing mutually beneficial and acceptable alternatives to improve fish passage in the Butte Sink, Butte Slough, and Sutter Bypass sections of Butte Creek while maintaining the viability of agriculture, seasonal wetlands, and other habitats. For this reason, the scope of this document will emphasize stewardship strategies within the watershed from its headwaters to its original confluence with the Sacramento River near Colusa. In an effort to apply a watershed-wide approach, however, the Conservancy and WAC/TAC will lend support to those stewardship efforts underway in the lower Butte Creek watershed.

In 1996, the Conservancy enlisted the services of the California State University, Chico Department of Geography and Planning to apply for State, Federal, and private grants for the development of a Watershed Management Strategy. Through the generosity of the US Fish & Wildlife Service, CALFED, National Fish & Wildlife Foundation, Bureau of Reclamation, and the Metropolitan Water District, the Conservancy set in motion the creation of the Butte Creek Watershed Management Strategy. This document is the culmination of that process.

Through media releases, flyers, and other public outreach efforts, stakeholders representing landowners, timber interests, urban representatives, agriculture, recreational groups, irrigation districts, conservation organizations, waterfowl clubs, and local, state, and federal agencies were invited to participate in an initial General Public Stakeholder Meeting. From this meeting, the nomination of individuals with diverse interests and representing different reaches of Butte Creek resulted in the creation of the Watershed Advisory Committee (WAC). While WAC participation fluctuated throughout much of the process, attendance was especially strong and diverse during the development of the Watershed Management Strategy. Additionally, agency personnel and others with distinct expertise were invited to serve as members to the Technical Advisory Committee (TAC). For further input, stakeholders were invited to general membership meetings to participate in a scoping process (6 four-hour meetings) to identify watershed Issues and Concerns for prioritization. These issues were categorized into fourteen groups, and from these, the WAC generated a list of fundamental issues and concerns. The issues and concerns identified by stakeholders and refined by the WAC are not science-based. They reflect the opinions of individuals involved in the watershed planning process at that point and time. The issues were defined as follows:

1. Increased population over the last ten years in the canyon and surrounding areas, as well as future growth, has increased recreational pressures in the watershed without increased infrastructure to accommodate the use. (Note: infrastructure has not kept up with the increase in population, i.e. the number of wardens, etc.).
2. The decline of the fisheries mainly due to water diversions and lack of screening has resulted in an Endangered Species Candidate listing for the spring-run chinook salmon leading to restrictions on sport fishing, the elimination of salmon and trout fishing, and could lead to further watershed-wide restrictions for multiple uses such as agriculture, timber management, recreation, urban development, and property rights.
3. The fuel load in the watershed is at an unacceptable level due to natural response to human-made interventions.

4. Inadequate timber management regulations and practices have potential impact on water quality.
5. Improper road design, construction and maintenance intercepts and redirects runoff, causing erosion and road washouts and may damage the watershed.
6. Groundwater recharge areas are not identified. These areas need to be considered and may need increased protection.
7. The quantity and quality of domestic water supplies need to be understood and protected.
8. Urban run-off due to increased urbanization contributes to water quality degradation.
9. Flooding in the Butte Creek watershed is natural and unavoidable, therefore any infrastructure, including housing and other structures on the floodplain must be compatible with flooding in an environmentally conscious and sustainable manner.
10. There is a need for public education addressing appropriate management practices for the above 9 items

Since the original scoping process, WAC members and resource agency representatives have agreed that many of the top 10 stakeholder issues and concerns as worded do not accurately reflect the exact nature or source of potential problems in the watershed. Additionally, while many of the issues do remain pressing, efforts have been undertaken to mitigate others making them less pertinent today. Nonetheless, the issues and concerns as defined during the stakeholder scoping process provide a good template for developing effective community-based strategies to enhance the economic, ecological, and cultural heritage of the Butte Creek watershed.

While the scoping process moved forward, work began on the Existing Conditions Report. The Existing Conditions Report is intended to accumulate into one document all relevant descriptive data related to the physical, natural, cultural, and economic resources of the Butte Creek watershed. The Existing Conditions Report, like the Watershed Management Strategy, is designed to function as a living document. Periodically, both documents will be revisited, revised, and updated. The most current version of each document can be found on the Conservancy's website at *http://www.buttecreekwatershed.org*. These documents should be used together, in order for the reader to understand the many complex issues within the Butte Creek watershed.

Following the completion of the Existing Conditions Report, a vision statement was adapted, as well as ten guiding principles to help steer the planning process. The vision statement for the watershed sees healthy fish populations, diverse biological habitats, recreation opportunities, reduced fire hazard, reliable and clean water supply, clean air, reduced flood damage, and a respect for private property rights. The guiding principles to achieve the vision are more specific and deal with natural resource management (fish, wildlife, erosion, flooding and fire), social issues (recreational impacts), coordination, and education. Project staff, working with TAC members, drafted Watershed Management Strategy goals and objectives for WAC review, refinement, and acceptance. The final goals and objectives were developed to provide an adaptive management framework for reconciling the Issues and Concerns identified early in the stakeholder scoping process, but they also took into account information recently made available in the development of the Existing Conditions Report. This strategy lists straightforward stewardship projects and actions that can be accomplished with a high probability of success and that will help maintain the health of the Butte Creek watershed.

INTRODUCTION

This Watershed Management Strategy is designed to accomplish the goal of maintaining a sustainable river ecosystem for the Butte Creek watershed. With increasing population and diversifying land use in the watershed, coordinated management becomes necessary in order to decrease negative impacts and to increase positive impacts. Economic vitality is necessary to enable the community to address and solve resource problems, and maintaining a healthy natural resource base is necessary for sustaining economic vitality. Establishment of a goal-oriented management strategy can prevent problems before they occur, and will result in less expensive and more efficient use of community energy and resources. The Watershed Advisory Committee (WAC) was formed to develop a community-based group representing landowners, timber interests, urban representatives, agriculture, recreational groups, irrigation districts, conservation organizations, and local agencies. The Technical Advisory Committee (TAC) members represent local, state, and federal resource specialists who were consulted in the development of this strategy.

Watershed Advisory Committee

Jack Bean	Sierra Pacific Industries, BCWC Board
Ed Chombeau	Landowner, BCWC President Upper Ridge Coordinating Council
Robb Cheal	Landowner, BCWC Board
Roger Cole	Landowner, Streaminders
Eric Ginney	
Allen Harthorn	Landowner
Chuck Kutz	Landowner, Chairman, BCWC Board
Jason Larrabee	Landowner, Larrabee Farms, BCWC Board
Tanis Larson	Landowner, Butte Meadows Hillsliders
Vickie Newlin	Butte County, Water and Resource Conservation Department
Jean Oscamou	Pacific Gas & Electric Company
Sharan Quigley	Landowner, BCWC Board
Michael Smith	Landowner
Ted Trimble	Western Canal Water District

Technical Advisory Committee

Howard Brown	Fisheries Biologist, Lassen National Forest
Jeff Harter	CDF/Butte County Fire
Mary Huggins	California Department of Forestry and Fire Protection
John Icanberry	US Fish and Wildlife Service
Mike Kossow	Meadowbrook Conservation Associates
Mike Madden	Butte County, Office of Emergency Service
Bart Prose	US Fish and Wildlife Service
Ken Roby	Lassen National Forest, USFS
Ron Rogers	US Bureau of Land Management
Doug Straw	Regional Water Quality Control Board
Gayland Taylor	California Department of Fish and Game
Russ Volke	Lassen National Forest, USFS
Paul Ward	California Department of Fish and Game

Vision Statement

In the summer of 1999, the WAC developed the following **vision statement** as a prerequisite for creating more specific **guiding principles**:

> The Butte Creek Watershed Advisory Committee was formed to develop community-based consensus driven strategies that foster healthy fish populations, diverse biological habitats, recreational opportunities, reduced fire hazard, reliable and clean water, reduced flood damage, and a strong respect for private property rights.

Guiding Principles

While the WAC agrees to the goals and objectives spelled out in the *Memorandum of Understanding Regarding the Development of the Butte Creek Watershed Management Strategy*, the WAC chose to develop a list of long-term principles to further guide the planning process:

1. Respect and protect private property rights within the watershed.
2. Respect and protect public resources within the watershed.
3. Coordinate public and private resources to develop a management strategy for the watershed that will provide guidance for resource conservation and land use for present and future generations.
4. Encourage good land stewardship practices through education, research, monitoring, and public outreach.
5. Emphasize conservation, restoration, and sound resource management in the Butte Creek watershed.
6. Preserve the cultural heritage, the historical land-use base, and economic vitality of the area.

7. Apply an ecosystem and multi-species approach to maintaining biodiversity through conservation and restoration of native habitats within the watershed.
8. Protect and enhance the long-term sustainability of the Butte Creek aquatic ecosystem with special consideration for salmon and steelhead populations.
9. Enhance water supply reliability for multiple beneficial uses.
10. Encourage improved communication and cooperation between agencies/organizations and landowners.
11. Meet yearly to reassess and prioritize new restoration goals and objectives

Strategy Organization

There is a large degree of overlap among the various *Issues and Concerns* identified during the scoping process. That overlap reflects the interconnectivity of natural processes, and the importance of applying a watershed management approach to issues that are of concern to all. In order to address the designated *Issues and Concerns* and to follow the adopted guiding principles, this document has been organized into the following sections:

1) *Education and Public Outreach*
2) *Recreation*
3) *Fisheries*
4) *Fuel Load/Timber Management/Roads*
5) *Groundwater and Water Supply*
6) *Water Quality*
7) *Flooding*
8) *Conclusions*

Implementation Effort

The information contained in this report is a result of the WAC's review of the condition of the Butte Creek watershed. The report contains the WAC's recommendations for future actions. This report will be augmented and updated regularly by the BCWC Board of Directors in order to be a continuing resource management tool.

Some of the key players involved in the management of the Butte Creek watershed are the landowners (represented by the Butte Creek Watershed Conservancy), private interests (agriculture, timber, hydropower, water purveyors, etc.), Butte Creek Watershed Advisory Committee, CSU, Chico, California Department of Fish and Game, U.S. Fish and Wildlife Service, Counties of Butte, Glenn, and Colusa, U.S. Forest Service, and other signatories to the MOU (see Appendix __). Many of these agencies and groups have their own resource implementation plans and are pursuing similar resource goals. One function of the Stakeholder

Scoping Sessions was to increase awareness of all the resource protection activities and coordinate efforts to benefit the natural environment.

Implementation involves putting recommendations into effect and monitoring their success and results. The Butte Creek Watershed Conservancy will establish implementation guidelines for the *Watershed Management Strategy* as prescribed in the Memorandum of Understanding. A *2000-2002 Implementation Plan* will be designed and approved by the Conservancy's Board of Directors that will utilize the information and recommendations contained in this report. The ability to measure the effectiveness of the activities designed to carry out the program recommendations should be considered in the design of the implementation guidelines.

Monitoring (systematically tracking, recording, and evaluating specific categories of data) is an important function of the implementation process that is discussed in the final section of this report. The work program for the Butte Creek watershed must be dynamic and responsive to changes in order to be comprehensive in nature.

Directly linked to monitoring are evaluation and adaptive management. Adaptive management is the process of refining or redefining management actions as a process unfolds and results are obtained. Adaptive management begins with a clearly defined set of goals and objectives; includes the development of actions meant to achieve those goals and objectives; and incorporates an evaluation of actions implemented to determine whether goals and objectives are being met. Goals and objectives, actions, and monitoring protocols are established given today's knowledge. Results are monitored and actions modified as needed to achieve or even modify goals.

This document provides the framework for continued responsible stewardship through effective management practices. The Conservancy and WAC look forward to working with the many stakeholders involved in this process to implement measures necessary to protect and enhance one of California's most beautiful streams. The WAC believes that an annual meeting would be an appropriate format to review the implementation efforts and successes of the *Watershed Management Strategy*.

CHAPTER 1: EDUCATION AND PUBLIC OUTREACH

Top 10 Stakeholder Issue(s):

10) There is a need for public education addressing appropriate management practices for the identified stakeholder issues.

Since the original scoping process, WAC members and resource agency representatives have agreed that many of the top 10 stakeholder issues and concerns as worded do not accurately reflect the exact nature or source of potential problems in the watershed. Additionally, while many of the issues do remain pressing, efforts have been undertaken to mitigate others making them less pertinent today. Nonetheless, the issues and concerns as defined during the stakeholder scoping process provide a good template for developing effective community-based strategies to enhance the economic, ecological, and cultural heritage of the Butte Creek watershed.

Status:

Education programs are important to develop a broader understanding of resource conservation issues at the individual and community level. They include, but are not limited to: protection of property rights, endangered species protection, water supply demands, land use practices, water quality, fire and flood hazard, and urban development. In particular, increased understanding of the resource issues that lead to the development of current conservation efforts within the Butte Creek watershed will increase awareness of these issues and facilitate creative solutions. Education and public outreach should include support for programs for all age groups in all areas of the watershed. The Conservancy needs to continue to play an active and focused role in educating the public on resource issues.

Education should seek to increase awareness of changing public policy and ecosystem restoration activities, foster active participation in conservation programs, and encourage wise use of natural resources. Where possible, education efforts should work with active educational resources and be coordinated with existing watershed groups and other local efforts.

The Butte Creek Education Project is a cooperative effort supported by funding from the U.S. Fish and Wildlife Service, CALFED Category III, and the Environmental Protection Agency. Essential aspects of the education program are to gain the support of teachers, schools, districts, and the community by providing the resources, equipment, personnel, and knowledge to facilitate involvement in watershed activities. This program is an important element for broadening the awareness of children and strengthening their commitment to the health of the environment.

Goal: Educate members of the community on the economic, cultural, and ecological heritage of the Butte Creek watershed including recreation, fisheries, fuel load/timber management/roads, groundwater and water supply, water quality, and flooding.

Objective #1: Continue to support the K-12 *Butte Creek Education Project.*

Implementation 1.A: Seek opportunities to coordinate watershed education projects on public and private lands (e.g., planting native vegetation, building duck and bat nesting boxes, and conducting on-stream studies of aquatic and terrestrial species).

Objective #2: Develop a strong education and public outreach program to encourage conservation and wise use of natural resources and preservation of the economic and cultural heritage of the watershed.

Implementation 2.A: Encourage development of a manual of Best Management Practices (BMP) applicable to the continued multiple land uses found in the Butte Creek watershed and make this manual available to landowners and resource managers in the watershed.

Implementation 2.B: Promote through education the preservation and protection of private property land holdings within the watershed.

Implementation 2.C: Prepare informational brochures about the Butte Creek watershed.

Implementation 2.D: Educate landowners about resource issues that impact private property and its management.

- Implications of various evaluations, assessments and recommendations (i.e., native species revegetation and riparian buffer zones).
- Implications of local, state, and federal rules and regulations.

Implementation 2.E: Facilitate dispersal of information about programs and potential funding opportunities for landowners.

Implementation 2.F: Increase media involvement through press releases informing the public about the watershed.

Implementation 2.G: Provide interpretive signs educating the public about sensitive habitat and heightening awareness of current watershed issues.

Objective #3: Continue Butte Creek Watershed Conservancy's public outreach role and efforts to implement the *Watershed Management Strategy*.

Implementation 3.A: Develop and disseminate to stakeholders the *Butte Creek Watershed Annual Report*.

Implementation 3.B: Encourage the Watershed Advisory Committee and Technical Advisory Committee to meet annually to develop the *Butte Creek Watershed Annual Report* to include water quality monitoring survey results, anadromous fish monitoring results, and the status of ongoing and proposed projects.

Implementation 3.C: Form partnerships with local, state, and federal agencies to promote local watershed stewardship programs.

Implementation 3.D: Maintain continuous outreach activities to promote this *Watershed Management Strategy*.

CHAPTER 2: RECREATION

Top 10 Stakeholder Issue(s):

1) Increased population over the last ten years in the canyon and surrounding areas, as well as future growth, has increased recreational pressures in the watershed without an increased infrastructure to accommodate the use. (Note: infrastructure has not kept up with the increase in population, i.e. the number of wardens.)

Since the original scoping process, WAC members and resource agency representatives have agreed that many of the top 10 stakeholder issues and concerns as worded do not accurately reflect the exact nature or source of potential problems in the watershed. Additionally, while many of the issues do remain pressing, efforts have been undertaken to mitigate others making them less pertinent today. Nonetheless, the issues and concerns as defined during the stakeholder scoping process provide a good template for developing effective community-based strategies to enhance the economic, ecological, and cultural heritage of the Butte Creek watershed.

Status:

The entire Butte Creek watershed, not just the Canyon, presents a number of challenging recreational issues. The watershed possesses qualities that make it enticing to recreational use: flowing water suitable for wading, swimming, and whitewater floating, fish, scenery, winter activities, riparian areas, hunting, trails, roads, and a generally natural or rural appearance. Population pressures are expected to increase in the future.

Recreation has clearly been a concern for many years by residents, resource agencies, and law enforcement agencies. The focus of much of the concern is the lower reaches of the canyon area frequented by tubers, swimmers, whitewater enthusiasts, bicyclists, auto tourists, anglers (prior to the closure of this section to fishing), and other recreationists. The only developed public sites in the canyon are the Honey Run Covered Bridge and the Centerville School and Museum. There are many undeveloped creek access areas, some private and some public, but with no definition of boundaries between private and public land. This has led to degradation of these undeveloped areas and numerous conflicts with private property owners. The increased population in Butte Creek Canyon, Paradise, and the Chico urban areas has exacerbated the problems. Restrictions on recreation in Bidwell Park in Chico and on the Sacramento River, specifically parking and alcohol regulations, have also contributed on increased impacts on Butte Creek.

Recreational facilities are located throughout the watershed: Butte Meadows, Forks of the Butte, Paradise, and the valley refuges, but there is no comprehensive management or consideration for the impacts of unmanaged recreation. Recent efforts by the Butte Creek Watershed Conservancy, Centerville Recreation and Historical Association, Honey Run Covered Bridge Association, Butte Creek Volunteer Fire Department, 4-H, and Paradise Parks and Recreation District have led to the formation of a Butte Creek Canyon Recreation Advisory Committee. This Committee provides a forum for establishing priorities to address recreational concerns in the Canyon. There is a general consensus among the Recreation Advisory Committee that more recreationists have a serious downside (i.e., traffic, trash, trespassing, etc.). However, the need to manage for proper parking, trash facilities, and public restrooms drives the effort. These same issues, and many more, were of concern to stakeholders throughout the watershed.

Goal: Reduce conflicts between recreational use and public safety, private property rights, and public trust resources.

Objective #1: Focus recreational use to existing public areas to eliminate random access to private property within the Butte Creek watershed.

Implementation 1.A: Support the efforts of regional recreation advisory committees (i.e., Butte Creek Canyon Recreation Advisory Committee) to ensure that recreational activities are consistent with local input and address local needs while maintaining responsible watershed stewardship.

Implementation 1.B: Support the use of signs and/or other passive deterrents to eliminate trespass on private property, or unmanaged access to public property in areas not designed for public use.

Implementation 1.C: Encourage the update of the Recreation Element of Butte County General Plan (1971).

Objective #2: Promote the management of public areas to minimize soil disturbance and threats of erosion.

Implementation 2.A: Provide informational signs and mentor recreational clubs and schools to inform the public of erosion areas and their related impacts.

Implementation 2.B: Control vehicle access to limit vehicles in unpaved areas.

Implementation 2.C: Assure that future recreational areas are carefully planned to protect fish and their habitat.

Objective #3: Maintain or increase the amount of land in public and private conservation protection.

Implementation 3.A: Work with existing land trusts, conservation organizations, and willing private owners to protect, restore, and enhance sensitive lands.

Implementation 3.B: Inform landowners about the pros and cons of conservation easements.

Objective #4: Support recreational fishing and explore options for increased fishing opportunities with landowners, CDFG biologists, wardens, and recreational fishery interests.

Implementation 4.A: Explore options for increased fishing opportunities.

Objective #5 Support the management of illegal parking, litter, overnight camping, and sanitation.

Implementation 5.A: Promote a campaign with multiple groups to "Clean Up the Watershed."

Implementation 5.B: Support an ordinance to prohibit overnight camping in the Butte Creek Canyon on public land not designated for overnight camping.

Implementation 5.C: Encourage an ordinance to prohibit glass in waterways in the Butte Creek watershed.

Implementation 5.D: Provide improved parking, restroom, and trash facilities at strategic recreation sites.

Objective #6: Provide a comprehensive recreational guidebook and map of the Butte Creek watershed that includes a foldout map with details of activities, facilities, and access that addresses different sections of the watershed

CHAPTER 3: FISHERIES

Top 10 Stakeholder Issue(s):

2) The decline of the fisheries mainly due to water diversions and lack of screening has resulted in an Endangered Species Candidate listing for the spring-run chinook salmon leading to restrictions on sport fishing, the elimination of salmon and trout fishing, and could lead to further watershed-wide restrictions for multiple uses such as agriculture, timber management, recreation, urban development, and property rights.

Since the original scoping process, WAC members and resource agency representatives have agreed that many of the top 10 stakeholder issues and concerns as worded do not accurately reflect the exact nature or source of potential problems in the watershed. Additionally, while many of the issues do remain pressing, efforts have been undertaken to mitigate others making them less pertinent today. Nonetheless, the issues and concerns as defined during the stakeholder scoping process provide a good template for developing effective community-based strategies to enhance the economic, ecological, and cultural heritage of the Butte Creek watershed.

Status:

One of the most debated issues in the stakeholder scoping process was the reason for the decline of the Butte Creek salmon fishery. Many factors have contributed to the decline of salmon and steelhead in the Central Valley, with varying similar effects upon other fish and aquatic resources. Due to the complex interrelationships of these factors, it is frequently impossible to quantify cause-and-effect for each. Principal factors influencing this decline, both throughout the Central Valley and Butte Creek, are habitat loss and habitat degradation, partially resulting from water project development and land management practices that did not adequately consider impacts to fish and aquatic resources. Considering the life history of salmon and steelhead, including the other anadromous and migratory fish found in Butte Creek, and the complexity of factors that may be affecting them outside the watershed, an analysis to determine what is limiting is really beyond the scope of this strategy. However, there is presently enough known about general habitat requirements and the interactions of aquatic systems and watershed processes to formulate management strategies, including the identification of potential restoration measures.

The reduced numbers of returning adults in the Central Valley has led to a "threatened" listing for spring-run under the California Endangered Species Act. In addition, the National Marine Fisheries Service (NMFS) has listed spring-run and steelhead trout as "threatened" in the Sacramento Valley mainstem and tributaries under the Federal Endangered Species Act. Fall and late-fall run chinook salmon, originally proposed for listing as "threatened', are now determined not to warrant listing at this time, but will remain a "candidate" species for reevaluation if new information becomes available. Spring-run salmon had encouraging adult returns in 1998 and 1999 in Deer, Mill, and Butte Creeks, but according to NMFS the numbers for the Central Valley were not sufficient to remove the spring-run from being listed. Butte Creek experienced a record return in 1998 of 20,000 spawners, but spring-run populations remain in the hundreds in most Central Valley streams.

Great strides have been taken by local communities, landowners, and local, state, and federal agencies to proactively pursue restoration and management activities that are beneficial to these anadromous salmonid resources. Current efforts to improve chinook salmon populations in the

Central Valley and Butte Creek are directed towards reduction of entrainment of juveniles in unscreened water diversions, increased instream flows, improvement of adult passage, improvement of water quality, and protection of riparian habitat. Significant restoration actions and evaluations for Butte Creek can be found in the U.S. Fish and Wildlife Service's *Revised Draft Restoration Plan for the Anadromous Fish Restoration Program* and the California Department of Fish and Game's *Status of Actions to Restore Central Valley Spring-Run Chinook Salmon* reports.

Goal: Enhance and maintain the Butte Creek watershed's native fishery, with emphasis on salmon and steelhead trout.

Objective #1: Support efforts to ensure that anadromous fish have adequate and convenient passage upstream and downstream on Butte Creek within existing ranges.

Implementation 1.A: Encourage California Department of Fish and Game to evaluate in-stream water flow standards for adequate fish passage based upon accepted methodology.

Implementation 1.B: Support voluntary and cooperative public and private restoration efforts for anadromous fish.

Implementation 1.C: Support continued evaluation of alternative water supply for fisheries.

Implementation 1.D: Utilize current Butte Creek stream flow-monitoring system.

Objective #2: Protect and enhance existing aquatic and riparian habitat.

Implementation 2.A: Support stream evaluations conducted by CDFG and USFWS.

Implementation 2.B: Map current riparian habitat along Butte Creek and assess future site-specific riparian restoration projects.

Implementation 2.C: Provide outreach, assistance, and incentives to willing landowners to create vegetated buffers between existing riparian habitat and adjacent areas.

Implementation 2.D: Develop guidelines for preserving large woody debris in the stream channel.

Implementation 2.E: Identify potential improvements to future bridge and other infrastructure designs that would permit large woody debris to pass without damage.

Objective #3: Maintain and improve Butte Creek's water quality to meet the life-cycle needs of native fish.

Implementation 3.A: Work with appropriate resource agencies to implement a comprehensive water quality monitoring program and prepare an annual water quality monitoring report.

Implementation 3.B: Support efforts to evaluate instream water flows sufficient to provide appropriate conditions for native fish.

Implementation 3.C: Encourage use of *Best Management Practices* for reducing the discharge of pollutants into the Butte Creek watershed.

Objective #4: Support enhancement and continued monitoring of salmon and steelhead populations.

Objective #5: Protect Butte Creek's native fish resource.

Implementation 5.A: Promote adequate game warden support.

Implementation 5.B: Promote "Streamwatch" program.

Implementation 5.C: Determine the adverse impacts to native fish from non-native species and manage those impacts to insignificant levels.

Objective #6: Determine appropriate chinook salmon and steelhead trout numbers for sustaining populations and eventual de-listing.

Implementation 6.A: Request appropriate state and federal agencies to determine realistic and appropriate populations for chinook salmon and steelhead trout within existing habitat.

Implementation 6.B: Investigate establishing delisting process.

Objective #7: Improve the quantity and quality of wildlife habitat in the Butte Creek watershed.

Implementation 7.A: Do not manage Butte Creek watershed's fishery resources to the detriment of other wildlife.

Implementation 7.B: Working with CDFG and USFWS, develop a list of priority wildlife habitat restoration/enhancement projects.

Implementation 7.C: Assess current habitat conditions for wildlife in the watershed.

Implementation 7.D: Identify potential habitat restoration/enhancement projects and assess their impact on species richness and priority species.

Implementation 7.E: Through incentives, encourage landowners to incorporate wildlife friendly management practices into their operations.

CHAPTER 4: FUEL LOAD/TIMBER MANAGEMENT/ROAD EROSION

Top 10 Stakeholder Issue(s):

3) The fuel load in the watershed is at an unacceptable level due to natural response to human-made interventions.

4) Inadequate timber management regulations and practices have potential impact on water quality.

5) *Improper road design, construction and maintenance intercepts and redirects runoff, causing erosion and road washouts and may damage the watershed.*

Since the original scoping process, WAC members and resource agency representatives have agreed that many of the top 10 stakeholder issues and concerns as worded do not accurately reflect the exact nature or source of potential problems in the watershed. Additionally, while many of the issues do remain pressing, efforts have been undertaken to mitigate others making them less pertinent today. Nonetheless, the issues and concerns as defined during the stakeholder scoping process provide a good template for developing effective community-based strategies to enhance the economic, ecological, and cultural heritage of the Butte Creek watershed.

FUEL LOAD

Status:

Throughout the watershed, wildfire has become an increasing concern. Historically, fire has been a major ecological process in the watershed that exerted profound influences on the evolution of watershed ecosystems. Resource management philosophy has established a fire policy based on suppression. Suppression has contributed to a substantial increase in fuel loads with little consideration given to the resulting relationships between species composition, fire frequency, and intensity.

Vegetation management programs, from different agencies, should be encouraged to reduce fuel loads. These programs would reduce the cost and losses in the urban interface zones caused by devastating wildfires. Local Fire Safe Councils have been formed to allow stakeholders to give input for their community, to educate, and to promote forest health.

Goal: Reduce the risk associated with catastrophic wildfire impacts on life, property, and natural resources.

Objective #1: Work with California Department of Forestry and Fire Protection, US Forest Service, Bureau of Land Management, and other appropriate parties to address fire protection and fuel load reduction while enhancing watershed health.

Implementation 1.A: Pursue community scoping sessions to determine local fire hazard concerns.

Implementation 1.B: Exchange information among all parties on all pre-suppression resources available for the fighting of wildfires in the watershed.

Implementation 1.C: Conduct strategic hazard reduction/fuelbreak projects.

Implementation 1.D: Support diverse fuel reduction management tools.

Implementation 1.E: Review CDF Butte Fire Plan that addresses some of the following issues:

- Pre- and Post-fire suppression procedures
- Roadside fuel reduction
- Coordination of public and private fuelbreaks
- Community evacuation plans
- Effect on stream and riparian habitat

Implementation 1.F: Support the distribution of public informational material for homeowners on the basic principles of wildland fire safety and forest health.

TIMBER MANAGEMENT/ROAD EROSION

Status:

The Z'berg-Nejedley Forest Practices Act of 1973 (the Act) has broad authority over timber harvest operations on private and state-owned land. The enforcement of the regulations, including the three-acre exemption, is difficult when one considers the vast expanse of timberlands over which the Act has jurisdiction. Potentially, the most significant timber management practice affecting water quality is roads.

Roads in the foothills and mountains are a source of sediment pollution. Almost no information is available on the contribution of unpaved roads to sedimentation in Butte Creek. There is estimated to be over 400 miles of unpaved roads in the upper watershed of Butte Creek and, with the exception of the main road system that is well designed and relatively stable, these roads could possibly be the largest single contributor to sedimentation in the upper watershed.

As a result of the Butte Creek watershed planning process, the first survey of unpaved forest roads in the upper Butte Creek watershed has been completed this year under a CALFED grant. The survey identified the soils and areas of highest potential erosion in three sub-watersheds (Bull, Varey, and Scotts John Creeks) and provides recommendations to mitigate sedimentation.

Goal: Maintain or enhance water quality and aquatic and terrestrial habitat on lands where timber harvesting occurs.

Objective #1: Support forest land management regulations and practices that sustain healthy forests.

Implementation 1.A: Encourage landowners/managers to use forest management activities that provide healthy vigorous forests, create habitat for a diversity of species, and reduce forest fuel loads.

Implementation 1.B: Encourage landowners to use resource management tools such as logging, prescribed fire, and biomass chipping to create and maintain shaded fuelbreaks and community defense zones. This may be done for private landowners through Timber Harvest Plans and Vegetation Management Projects, or on public lands with Timber Sales and service contracts.

Goal: Minimize accelerated erosion resulting from management activities.

Objective #1: Develop and provide a Best Management Practices (BMP) manual through cooperative landowner action.

Objective #2: Survey road systems, prioritize potential problem areas, and prepare projects so they are "ready to go" as funding becomes available.

CHAPTER 5: GROUNDWATER AND WATER SUPPLY

Top 10 Stakeholder Issue(s):

6) Groundwater recharge areas are not identified. These areas need to be considered and may need increased protection.

7) The quantity and quality of domestic water supplies need to be understood and protected.

Since the original scoping process, WAC members and resource agency representatives have agreed that many of the top 10 stakeholder issues and concerns as worded do not accurately reflect the exact nature or source of potential problems in the watershed. Additionally, while many of the issues do remain pressing, efforts have been undertaken to mitigate others making them less pertinent today. Nonetheless, the issues and concerns as defined during the stakeholder scoping process provide a good template for developing effective community-based strategies to enhance the economic, ecological, and cultural heritage of the Butte Creek watershed.

GROUNDWATER

Status:

The Butte Creek watershed can be divided into two general groundwater resource areas: the Sacramento Valley (Butte Basin), which is the major groundwater basin, and the foothills and mountains to the east-northeast, which currently have limited groundwater resources. Butte Creek flows through these hydrologically connected basins. Because this area contains a large internal creek system, imported surface water, and a vast groundwater basin, complete understanding of groundwater supplies are difficult to obtain. Many factors affect the status of groundwater within the watershed. Many local agencies and organizations are actively evaluating the groundwater resources and should be the point of contact for the most accurate and recent information. It is beyond the scope of this report to provide this information.

Groundwater levels fluctuate annually because of groundwater extractions, recharge from precipitation, stream percolation, infiltration of imported surface irrigation water, and subsurface inflow and outflow. Levels are usually highest in the spring and lowest during irrigation in the late summer months.

The Butte Basin Water Users Association was created to facilitate proper management and preservation of groundwater resources. This organization is a coalition of various basin water interests that meets monthly to address water issues.

Butte County and Glenn County have groundwater protection ordinances that pertain to groundwater in the watershed. Chapter 33 of the Butte County code requires that all transfers of groundwater, or surface water that is replaced by groundwater pumped for overlying use, require a permit issued by the Butte County Water Commission.

The status and uses of the groundwater resources in the watershed is a strongly debated issue of concern. However it is apparent that most stakeholders realize the need for additional accurate information to better understand and preserve this important resource.

Goal: Safe and reliable groundwater resources for multiple beneficial uses.

Objective #1: Identify and protect recharge capability of lands important to the aquifers associated with Butte Creek.

Implementation 1.A: Support the protection of imported surface water supply that contributes to the recharge of groundwater.

Implementation 1.B: Support expansion of groundwater level monitoring efforts.

Implementation 1.C: Promote projects that enhance water retention time in the upper watershed and recharge regions.

Objective #2: Support ongoing local, state, and federal investigations of Butte Creek watershed groundwater resources.

WATER SUPPLY

Status:

Available quantities of water for domestic supplies are fairly well understood and protection measures are utilized in most areas. The development of the ridge communities of Paradise, Magalia, Paradise Pines, Forest Ranch, and surrounding urban development has changed the nature of water use in this area. The existing systems were not designed to meet the needs of a rapidly growing urban area and are strained by the demand. The vast majority of the rest of the watershed is dependent on well water for domestic use and quantities are generally adequate. The County of Butte has hired a consultant to conduct a water analysis that will investigate and inventory water resources within the county.

Goal: Provide safe and reliable water supply and delivery for multiple beneficial uses.

Objective #1: Support ongoing local, state, and federal investigations to insure adequate water supply for multiple beneficial uses.

Implementation 1.A: Support the Butte County Water Inventory Analysis.

Implementation 1.B: Support expansion of water monitoring efforts.

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Objective #2: Provide reliable delivery infrastructure for local beneficial uses.

Implementation 2.A: Support "Area of Origin" protections that meet local needs.

Implementation 2.B: Promote use of Butte County's water entitlement of Lake Oroville water to maximize multiple local beneficial uses.

Objective #3: Promote further voluntary efficient water use (see *Education Chapter*).

CHAPTER 6: WATER QUALITY

Stakeholder Issue(s):

8) Urban run-off due to increased urbanization contributes to water quality degradation.

Since the original scoping process, WAC members and resource agency representatives have agreed that many of the top 10 stakeholder issues and concerns as worded do not accurately reflect the exact nature or source of potential problems in the watershed. Additionally, while many of the issues do remain pressing, efforts have been undertaken to mitigate others making them less pertinent today. Nonetheless, the issues and concerns as defined during the stakeholder scoping process provide a good template for developing effective community-based strategies to enhance the economic, ecological, and cultural heritage of the Butte Creek watershed.

Status:

Available data indicate that overall water quality in Butte Creek ranges from good to excellent in the upper portions of the watershed, and varies in quality lower in the creek system. These data were generated using water quality parameters appropriate for drinking water. Newer criteria were established that set much more stringent requirements for the protection of aquatic life. Historic data, while important, is not wholly sufficient in determining whether water quality in Butte Creek is suitable for the protection of aquatic life. Water quality can vary seasonally, corresponding to precipitation, discharges, and diversions. It can also vary year to year depending on drought or wet conditions.

The California Department of Water Resources (DWR) maintains basic water quality monitoring stations at the *Butte Creek near Chico* gauge below the Honey Run Covered Bridge and at Butte Slough, and has conducted periodic additional monitoring at other sites. This program, however, provides only minimal inorganic chemical analyses. Additional water quality assessment and monitoring for both inorganic and organic chemical parameters would be beneficial for characterizing existing conditions within the watershed. DWR is prepared to conduct a *Comprehensive Butte Creek Water Quality Monitoring Program.* If funded, this program will allow watershed planners to better monitor water quality and thereby enhance decision-making.

Goal: Maintain and enhance water quality in Butte Creek to benefit human use, as well as fish and wildlife.

Objective #1: Encourage volunteer efforts to protect water quality of Butte Creek from non-point sources of pollution.

Implementation 1.A: Encourage willing landowners to create vegetated buffer zones between Butte Creek and adjacent lands.

Implementation 1.B: Seek to maintain and enhance riparian habitat along Butte Creek and its tributaries.

Implementation 1.C: Inform landowners about the pros and cons of conservation easements.

Implementation 1.D: Promote land use planning that maximizes infiltration and minimizes run-off.

Objective #2: Encourage long-term comprehensive water quality monitoring for Butte Creek.

Implementation 2.A: Support public and private efforts to implement coordinated and comprehensive water quality monitoring on Butte Creek and generate and disseminate an annual report.

CHAPTER 7: FLOODING

Top 10 Stakeholder Issue(s):

9) Flooding in the Butte Creek watershed is natural and unavoidable, therefore any infrastructure, including housing and other structures on the floodplain must be compatible with flooding in an environmentally conscious and sustainable manner.

Since the original scoping process, WAC members and resource agency representatives have agreed that many of the top 10 stakeholder issues and concerns as worded do not accurately reflect the exact nature or source of potential problems in the watershed. Additionally, while many of the issues do remain pressing, efforts have been undertaken to mitigate others making them less pertinent today. Nonetheless, the issues and concerns as defined during the stakeholder scoping process provide a good template for developing effective community-based strategies to enhance the economic, ecological, and cultural heritage of the Butte Creek watershed.

Status:

The flood of '96-'97 served as a harsh and costly reminder that in any watershed the potential problems from episodic storm conditions are immense, diverse, and particularly widespread. California's climate is noted for episodic events. Current traditional flood protection and control projects may, in fact, have a negative effect on floodplain function. The habitat needs of humans and the wildlife that depend on this watershed and the riparian ecosystem must be carefully managed. Management recommendations that consider the best scientific information on habitat needs, protection, and restoration, and the fluvial geomorphology of the creek must be developed within the parameters of the episodic nature of Butte Creek watershed floods. Most importantly, human land use practices that may be contributing and exacerbating flood events must be carefully analyzed. A study of the fluvial geomorphology of the alluvial portions of Butte Creek, from above Helltown to Highway 162, is being conducted. When complete, this report will provide valuable recommendations on management goals necessary to protect people and the function of valuable stream habitat for this reach of Butte Creek.

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.

Implementation 1.A: Work with interested stakeholders and local, state, and federal agencies to develop a **Butte Creek Watershed Flood Plan** that enhances flood management and natural channel processes.

Implementation 1.B: To protect flood prone areas of Butte Creek, inform landowners about the pros and cons of easements and the potential detrimental impacts of building in the floodplain.

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

Implementation 2.A: Develop a committee to work with local, state, and federal agencies to enhance public awareness, flood management, and fish and wildlife habitat.

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

IMPLEMENTATION, MONITORING, AND UPDATING THE WATERSHED PLANNING PROCESS

The development of watershed goals and objectives and the selection of management alternatives do not mark the end of the strategy development process. Successful watershed management requires careful consideration of how the plan will be implemented, monitored, and evaluated. In addition, it requires a commitment to long-term planning and management that facilitates adaptation and adjustment in light of changing ecological, social, and economic factors.

Developing an Annual Work Plan

Implementation involves putting recommendations into effect. The Butte Creek Watershed Conservancy should establish implementation guidelines for the *Watershed Management Strategy* as prescribed in the Memorandum of Understanding. A *2000-2002 Implementation Plan* should be designed and approved by the Conservancy's Board of Directors that utilizes the information and recommendations included, but not limited to, this report. The *Implementation Plan* should prioritize *Watershed Management Strategy* objectives and implementation steps based on maximum feasibility and cost effectiveness. Projects with the greatest biological and community well-being benefit and highest cost effective return should receive priority. The *Implementation Plan* will serve as the template for the coming years' focused efforts.

Securing Funding for Implementation

An essential component of this *Watershed Management Strategy* is the availability of funds to implement the plan. Identifying potential funding sources should be one of the first priorities of those groups involved in the implementation. It is important to remember that financing might ultimately come from several sources. All benefactors, both public and private, should be identified and appropriate cost-sharing arrangements should be developed.

Because many funding sources (CALFED, AFRP, Prop. 204, etc.) are designed for specific types of activities, project implementers need to piece them together in order to pursue the *Watershed Management Strategy* goals. Also, many government grants require local matching funds or in-kind services. Private foundations are often more flexible, but may favor groups that can attract several funding sources.

An important element of securing funding is linking the available resources to the specific activities that will be part of the implementation. Specifically, it is important to categorize the various activities, determine how much each activity will cost to implement, and determine how much funding is available for each activity. In performing this analysis it should be noted that funding need not be thought of exclusively in terms of available "cash." Often many of the activities that are part of the effort can be completed with the work of a participating agency or some other organization.

It is important to note that there might be insufficient funding to carry out all of the activities outlined in the *Watershed Management Strategy*. In this situation, it is important to recognize that this is, in fact, a common occurrence and that the process should proceed. Typically, if this watershed management process demonstrates positive results and benefits, additional funding will become available.

Monitoring and Adaptive Management

The watershed effort is not considered complete once the design has been developed. Monitoring, evaluation, and adaptive management are essential components that must be undertaken to ensure success. Monitoring includes both pre- and post-monitoring, as well as monitoring during actual implementation. All are essential to determining the success of the design. Monitoring provides needed information, documents chronological and other aspects of succession, and provides lessons learned to be used in similar future efforts. To develop appropriate monitoring and assessment protocols, a good reference is CALFED's *Comprehensive Monitoring, Assessment, and Research Program* (CMARP).

Directly linked to monitoring are evaluation and adaptive management. Adaptive management is the process of refining or redefining management actions as a process unfolds and results are obtained. It is an interactive and iterative approach to decision-making that incorporates feedback loops for evaluating actions and injecting new information as it becomes available. Adaptive management begins with a clearly defined set of management goals and objectives; includes the development of actions meant to achieve those goals and objectives; and incorporates an evaluation of actions implemented to determine whether goals and objectives are being met. Goals and objectives, actions, and monitoring protocols are established given today's knowledge. Results are monitored and actions modified as needed to achieve or even modify management goals. Since restoration is a new science with substantial uncertainty, adaptive management to incorporate new midcourse information should be expected. Moreover, through adaptive management, specific problems can be focused on and corrected.

Updating the Butte Creek Watershed Management Strategy and Existing Conditions Report

Improved information on the condition of the Butte Creek watershed and potential new actions to enhance watershed health will accumulate continually. For example, as assessments are performed and projects are completed, additional tasks required to enhance watershed health will certainly be identified. Also, watershed analyses by other groups, such as the U.S. Forest Service or California Department of Fish and Game, may be useful to the implementation of the *Watershed Management Strategy*. Other types of information, such as changes in willingness of landowners to participate, changes in regulations, and new funding opportunities may also affect implementation.

New information needs to be included in the watershed planning process at all levels, especially the *Existing Conditions Report* and the *Watershed Management Strategy*. Recommended changes to both of these planning documents can certainly come from any member of the community, but probably will come from members of the Butte Creek Watershed Conservancy or the Watershed Advisory Committee. These recommendations, addendum, or suggestions should be made at an annual Stakeholder meeting to be held by the Conservancy in January of each year. Recommendations for physical changes to the *Existing Conditions Report* or the *Watershed Management Strategy* will be adopted by a majority vote of the Butte Creek Watershed Conservancy Board of Directors.