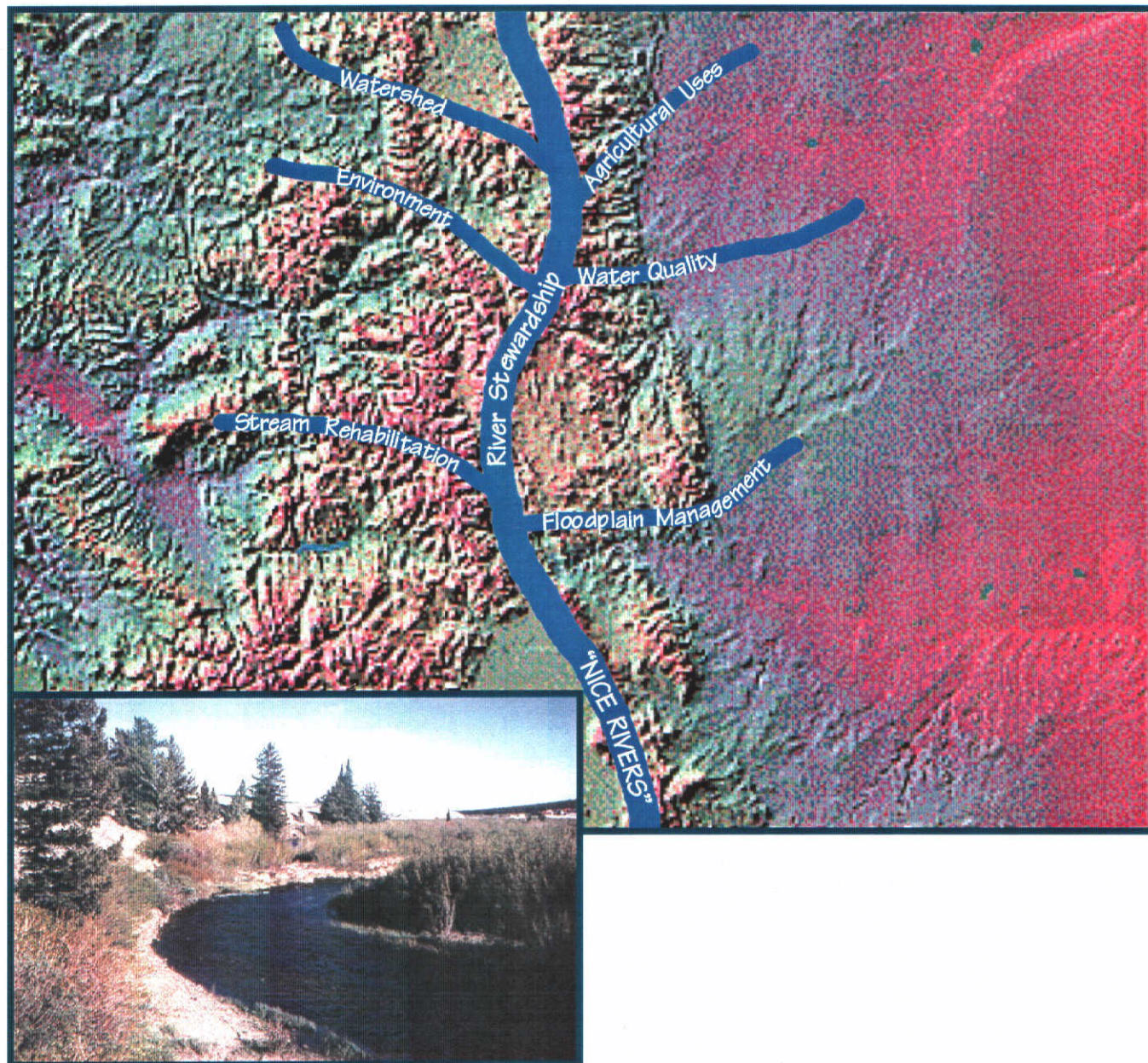


Peter Evans
STEWARDSHIP OF COLORADO CWCB
STREAM CORRIDORS
Pub 69



Colorado Water Conservation Board
Department of Natural Resources
721 Centennial Bldg. • 1313 Sherman Street
Denver, CO 80201
(303) 866-3441



McLaughlin Water Engineers, Ltd.
2420 Alcott Street
Denver, CO 80211
(303) 458-5550

EXECUTIVE SUMMARY FOR THE STATEWIDE RIVER REHABILITATION AND FLOODPLAIN NEEDS INVENTORY

The Colorado Water Conservation Board (CWCB) inventory addresses issues regarding the preservation of our nice rivers; destroyed habitat; lost land; a need for money; multi-objective approaches; and teamwork. These are the focus of the CWCB's recent survey conducted in an effort to provide better guidance in the management of Colorado's rivers and floodplains. The Board initiated a Needs Survey to inventory the needs that Colorado landowners and communities see in dealing with stream corridors, floodplains, and watersheds and to determine the successes they are experiencing. The importance of determining these needs cannot be underestimated since it is tied so directly to the better management of the State's stream corridors. The attributes of living and working in Colorado, which include those stream corridors, continue to attract new people whose presence in turn affects the State's watersheds and their components: the floodplains and stream corridors.

The Board's contractor, McLaughlin Water Engineers, Ltd. (MWE), was contracted by the CWCB to assist with the survey of the State's 321 communities (63 counties and 268 cities and towns), and of 110 flood and water related organizations having an interest in the State's stream corridors. The response rate to the statewide assessment survey has been very high, with 141 survey questionnaires returned. MWE also assisted the CWCB with the interpretation of the survey results and the development of recommendations for responding to the needs identified.

The completed questionnaires provided a good overview of floodplain issues, planning and implementation needs, and existing environmental and institutional concerns in Colorado. In addition, the needs survey has provided direct communication from floodplain administrators, land use coordinators, government entities, landowners, and the water and environmental communities who deal directly with water resources and flood-related issues.

The survey yielded findings which provide an overview of statewide needs for the Board staff and the Project Steering Committee. (See Table ES1 for the Committee Membership list.) The survey findings offer a basis for understanding needs and formulating recommendations for meeting those needs. The statewide needs for floodplain and stream corridor management have been compiled by the CWCB's contractor. At the January 14, 1998 Committee meeting, the CWCB^{staff} and the Committee agreed on the following categories of needs: **planning assistance, funding for project and planning implementation, public information/technical assistance, and policy and criteria guidelines.** The committee selected a project title of "The Stewardship of Colorado Stream Corridors".

Planning Assistance. Many of the State's watersheds have an absence of an overall plan for addressing the rehabilitation or restoration of the channels and floodplains that have been eroded or flood ravaged. With the implementation of short-term, site specific projects, longer-term problems are created which might have been avoided, or at least minimized, if the initial activities had been undertaken with a broader perspective. In addition to taking a watershed approach, these plans need to consider the full range of interests in the watershed through a multi-objective approach. Funding needs to be provided for multi-objective watershed master plan activities and local floodplain mapping and mitigation planning. Planning assistance is needed for technical evaluations and development of stream corridor management plans.

Funding for Project and Planning Implementation. The single most common need identified in the questionnaire was the need for a mechanism to fund projects. Nearly every respondent said there are stream corridor and watershed needs which cannot be met with current resources. Many respondents suggested that a Statewide Revolving Fund Loan Program be established which could be used in a variety of ways. In addition to creating one or more funding mechanisms for stream corridor projects, an important component of implementation would be to expand the funding opportunities to allow the Board more partnership options with federal agencies, and to facilitate stream restoration activities.

Public Information/Technical Assistance. There are three very important components to information. The first is data, the second is technical training to interpret the data and make meaningful and wise decisions from that data, and the third is education to implement the data and take advantage of the technical expertise. Much of the data that contributes to current watershed management decisions in the floodplain portion of the watershed consists of FEMA Flood Insurance Reports. Most of the data and maps were developed in the early 1970's and are lacking detail in many ways. The need to update these data is critical to successfully designing for current development patterns, planning for future development activities and preparing for the 21st century. Many communities cited a lack of technical expertise as a key problem in helping to plan and implement stream corridor improvements or stabilization. In addition, the responses indicated a need for educating administrators and landowners on the principals of floodplain management.

Policy and Criteria. Several definitions need to be added to the current statutory language for floodplain management activities. These include defining the "base flood" for the State floodplain management activities as that flood event with a 100-year return frequency (1 percent chance). This 100-year definition is currently the State's regulatory design criteria. It is recommended that "critical facilities" be protected from losses by a 500-year return frequency (0.2 percent chance). "Critical facilities" should be defined as facilities necessary to maintain the health and safety of the public in a community, except for public road systems. In addition, a statewide flood detention policy should be proposed, requiring that increased storm runoff from new development activities shall be detained and standards should be provided for how that should be accomplished. This action will require establishment of a "baseline hydrologic condition" for the State's basins/watersheds. There is also a need to create a wetland banking/accounting and replacement program to assist in maintaining existing wetland conditions. The banking system would protect the state's existing level of wetlands and provide opportunities for the better management of future development activities.

Recommended Actions. A need exists to draft a floodplain management and stream rehabilitation program to provide a planning partnership between landowners and local and state government groups. **The program needs a funding mechanism for watershed planning activities and project implementation.** Based upon the study findings, the project team recommends that a "revolving loan fund" can best meet the needs of many of the program objectives, and the loan fund was supported by the Steering Committee.

TABLE ES1
STEERING COMMITTEE MEMBERSHIP

Name	Affiliation	Phone	Fax
Ernest Gianinetti	Agricultural Landowner	(970) 963-2275	(970) 963-4066
Bob Sakata	Agricultural Landowner	(303) 659-1559	(303) 659-7865
Ron Cattany	Dept. of Nat. Res.	(303) 866-3311	(303) 866-2115
Laurie Mathews or Paul Flack	Div. Of Parks & Rec.	(303) 866-3202	(303) 866-3206
Hal Knott	Dept. of Local Affairs	(303) 866-2156	(303) 866-4992
John Hamill or Chuck Elliot	US Fish & Wildlife Service	(303) 236-8155 x252 (303) 236-5365 x222	(303) 236-8163 (303) 236-4631
Lt. Col. Lloyd Wagner or Jim Townsend	Army Corps of Engineers, Albuquerque Dist.	(505) 342-3432	(505) 342-3489
John Fischbach or Bob Smith	City of Fort Collins	(970) 221-6500	(970) 224-6107
Kent Mueller	Manager, Town of Basalt	(970) 927-4701	(970) 927-4703
Butch Knowlton	La Plata County	(970) 382-6250	(970) 382-6298
Kathy Hall	Mesa County Commissioner	(970) 244-1604	(970) 244-1639
Barbara Kirkmeyer	Weld County Commissioner	(970) 356-4000	(970) 352-0242
Michael Stevens	Stream Geomorphologist	(303) 444-7120	(303) 444-8471
Eric Wilkinson	N. Colo. Water Cons. Dist.	(970) 667-2437	(970) 663-6907
Steve Prokopiak	Land Development/Real Estate	(303) 573-0066	(303) 573-6916
Jane Bunin	Natural Science Associates	(303) 499-5014	(303) 499-5014
Scott Tucker	Urban Drainage and Flood Control District	(303) 455-6277	(303) 455-7880
Michael Hart	Gravel Pit Mining/Reclamation	(303) 444-6602	(303) 444-6602

STATE OF COLORADO

Colorado Water Conservation Board Department of Natural Resources

721 Centennial Building
1313 Sherman Street
Denver, Colorado 80203
Phone: (303) 866-3441
FAX: (303) 866-4474

MEMORANDUM



Roy Romer
Governor

James S. Lochhead
Executive Director, DNR

Daries C. Lile, P.E.
Director, CWCB

TO: Steering Committee Members

FROM: Larry Lang
Carolyn Adams

SUBJECT: Committee Meeting Five for the "Statewide River Rehabilitation and Floodplain Management Needs Inventory"

REMINDER AND NOTICE!

Our Steering Committee meeting will be conducted:

Date: **March 12, 1998**

Time: **9:00am – 11:00pm**

Place: Colorado Centennial Building
1313 Sherman St. Room 719
Denver, CO

The agenda for Committee Meeting Five is:

- Discuss the concerns as stated in the minutes for the February 18, 1998 meeting
- Update on implementation for project findings and recommendations
- McLaughlin Water Engineers will:
 - Present findings in the draft report
 - Present the proposed informational brochure
- Discuss legislative support strategies; and
- Future directions for the project findings and recommendations.

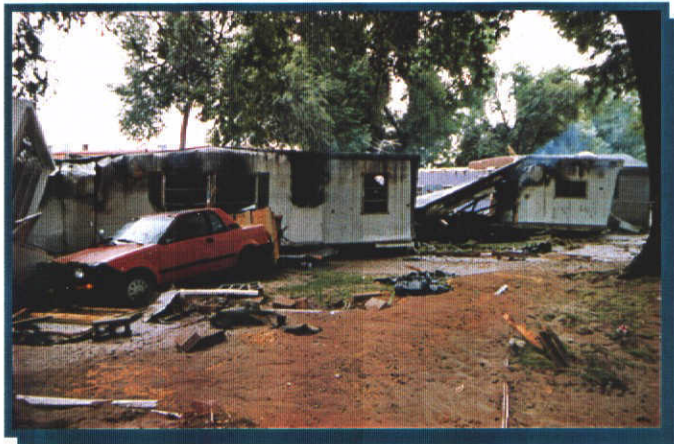
Some ideas for future direction are:

- Keep pursuing state legislation
- Seek a legislative resolution to conduct a statewide review; and
- Seek a special funding proposal to GOCO

I apologize for not mailing the brochure or the draft report by February 28, 1998. The state print shop lost the brochure. You will receive a copy at the meeting. I would like to finalize the brochure at the meeting, so your input is important!

If you have any questions, please call Carolyn Adams or Larry Lang at (303) 866-3441.

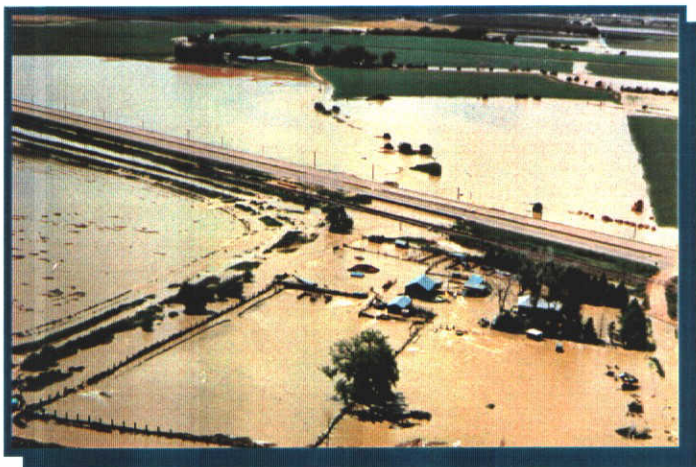
STEWARDSHIP OF COLORADO STREAM CORRIDORS



1997 Flood Damage - Fort Collins, Colorado



Colorado Water Conservation Board
Department of Natural Resources
721 Centennial Bldg. • 1313 Sherman Street
Denver, CO 80201
(303) 866-3441



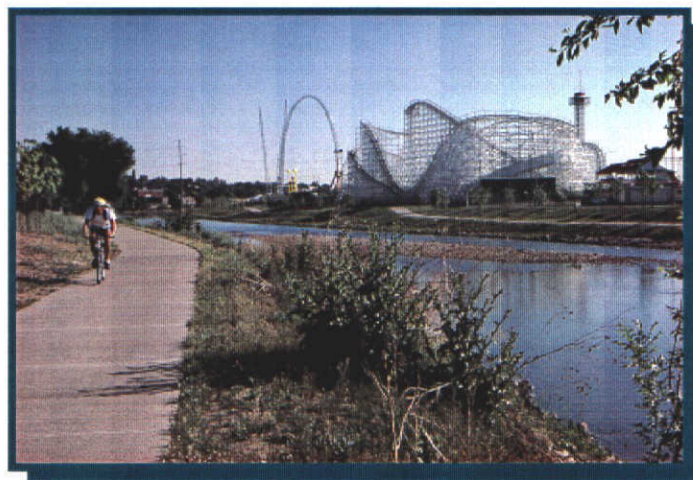
1997 Pawnee Creek Flooding near Atwood, Colorado



McLaughlin Water Engineers, Ltd.
2420 Alcott Street
Denver, CO 80211
(303) 458-5550



Roaring Fork River Stream Corridor Preserved



South Platte Multi-Purpose Flood Mitigation Project

**PROJECT REPORT TO
THE COLORADO WATER CONSERVATION BOARD
FOR "THE STEWARDSHIP OF STREAM CORRIDORS
IN COLORADO"**

January, 1998

PURPOSE

The purpose of the study was to obtain input from local communities and stakeholders to guide the CWCB regarding the feasibility of developing a new or expanded comprehensive approach and provide financial resources for local governments and special districts to better manage and address flood-related and multi-objective river issues. Colorado has undergone a significant growth trend, which is expected to continue. The state has also experienced significant flooding in some of its more populated areas. The successes, shortcomings, and needs resulting from this combination of population growth and flood events are very valuable input to properly manage and deal with Colorado's watersheds, stream corridors and floodplains.

LEGISLATIVE AUTHORIZATION -STATE STRATEGY

The Water Conservation Board, though the state wide needs assessment process is hereby responding to Senate Bill 97-008, Section 9 which states: *"Statewide river rehabilitation and floodplain management needs inventory. The Colorado water conservation board is hereby authorized to expend up to one hundred thousand dollars (\$100,000) from the Colorado water conservation board construction fund to develop a scope of work and contract for services to conduct a statewide inventory of river channel restoration and floodplain management needs. The findings of the needs assessment will be the basis for a proposal to determine the economic feasibility of establishing a statewide floodplain management and river channel rehabilitation program funded separately from the Colorado water conservation board construction fund. The proposed program would represent a comprehensive approach and source of funds for local governments to better manage mitigation measures, streambanks and channel erosion, loss of channel conveyance capacity, and loss of wildlife habitat areas."*

COLORADO FLOOD HISTORY

Between July 28 and August 17, 1997, extreme flooding impacted a thirteen-county area of Colorado as a result of a monsoonal storm system which stalled over the front range area. Point rainfall amounts of 8.3 inches to 15 inches were recorded. An estimated \$200 million in flood damages resulted in the Fort Collins/Larimer County area, and an additional \$50 million in damages occurred in twelve other counties. Six deaths were attributed to the flooding and the thirteen-county area received a Presidential Disaster Declaration

Stream and riverine flooding has always been, and remains to be, the greatest potential hazard to life and property in Colorado. Table 1 illustrates the most damaging floods that have occurred throughout the state since the turn of the century. Today, flood prone areas have been identified in 268 cities and towns and in all of the 63 counties in Colorado. According to CWCB staff, 250,000 people are estimated to now reside in Colorado's 100-year floodplains, with property valued at over \$11 billion. There is a clear need for improved floodplain management efforts to

reduce the at-risk population's vulnerability to flooding, prevent further encroachment into flood hazard zones, and preserve the natural resources and function of the floodplain areas.

Table 1
Most Damaging Floods in Colorado

Date	Major Stream or Location	Deaths	Historical Damages	Damages in 1997 dollars(1)
July 1896	Bear Creek at Morrison	27	\$-----	\$-----
Oct. 1901	San Juan River near Pagosa Springs	2	100,000	6.3m
July 1912	Cherry Creek at Denver	2	1,000,000	64.3m
June 1921	Arkansas River at Pueblo	78	19,000,000	550.4m
May 1935	Monument Creek at Colorado Springs	18	1,760,000	52.5m
May 1935	Kiowa Creek near Kiowa	9	-----	-----
May 1955	Purgatorie River at Trinidad	2	4,000,000	35.5m
June 1965	South Platte River at Denver	8	500,000,000	3000.m
June 1965	Arkansas River Basin	16	46,700,000	281.5m
May 1969	South Platte River Basin	0	5,000,000	23.0m
Sept. 1970	Southwest Colorado	0	4,000,000	17.0 m
May 1973	South Platte River at Denver	10	121,500,000	375 m
July 1976	Big Thompson River in Canyon	144	35,500,000	86.5 m
July 1982	Fall River at Estes Park	3	30,680,000	46.0 m
June 1983	North Central Counties	10	17,500,000	25.1 m
May-June 1984	Western and Northwestern Counties	2	31,000,000	43.7 m
May-June 1993	Flooding Western Slope	0	1,794,830	2.0 m
May-June 1995	Statewide Colorado	21	46,500,000	50.1 m
June, July, Aug. 1997	Fort Collins, Larimer, Weld Logan, Phillips, Morgan, Elbert, Lincoln, Crowley, Kiowa, Otero, Prowers, Baca, and Clear Creek Counties	6	250,000,000	250 m
Total		342		\$4.91 billion

(1) The letter "m" denotes millions of dollars.

SCOPE

The scope of the project included hiring a consulting firm, McLaughlin Water Engineers (MWE) of Denver, Colorado, who then contacted representatives of 268 floodprone Colorado communities and all 63 Colorado counties, as identified by the Colorado Water Conservation Board. The contact method chosen was a needs survey requesting communities and water related organizations to identify and inventory their needs and identify their successes in dealing with watersheds, stream corridors and floodplains.

PROCESSES UTILIZED

The process involved forming a Steering Committee to provide an overview of the project; bring an expanded level of expertise and perspective; provide direction and comment; endorse the study findings; and provide recommendations to the CWCB. A survey questionnaire was created to solicit information from 321 communities and 110 environmental and water related organization.

The findings from this survey and the associated follow up contacts with community representatives were then used to create a computer based data base to analyze and identify problems and areas of needs. The findings served as the basis for recommended programs to address those needs.

ASSESSMENT PROCESS

Survey Questionnaire Development

A needs survey, in the form of a seven page questionnaire containing 28 different areas for response, was jointly developed by CWCB staff, the Steering Committee and MWE project staff, to: 1) secure information regarding community profiles, pressing interests and values of stream corridors, 2) solicit and identify basin needs and programs from water organizations, 3) inventory existing flood problems, 4) evaluate existing programs, 5) determine future needs, and 6) formulate recommendations for consideration by the CWCB.

Follow up

The questionnaire was mailed on October 23, 1997 with a requested return date of November 14, 1997. The November 14th response rate for the communities was 10 percent, and 17 percent for the counties. MWE staff and associates called those who had failed to return their questionnaires. There were several reasons for the lack of response, including outdated addresses and phone numbers, staff turnover, and demands of current work load. An intense effort of follow up phone calls improved the response rate so by the end of December, 1997, nearly 40 percent of communities and 44 percent of counties had sent in their survey questionnaire. In addition, 21 percent of the organizations returned their questionnaires.

Data Base Development

A data base was designed to allow the results of the survey questionnaire responses to be entered and subsequently queried for information. The data base allows nearly 4000 responses to be further investigated and examined to aid in focusing the recommendations described in this report

and in targeting programs to address those needs identified most effectively.

Findings and Results

Figure 1-Problems with Flooding and/or Drainage, describes the problems identified by the 134 survey respondents in dealing with flooding and/or drainage in their communities. The responses indicate a wide variety of problems are being experienced by these communities, indicating the need for a multi-objective approach to solving these problems.

Figure 2-Values of Colorado Stream Corridors, shows the variety of values placed on stream corridors by survey respondents and indicates the need to broaden the factors considered in stream corridor and floodplain management to insure a multi-objective perspective is preserved when making decisions about current and future uses of this portion of the watershed. These values are in addition to the obvious purposes of conveying water as part of the natural hydrologic cycle, including flood water flows from the upper watershed downstream to the lower watershed

Figure 3-Funding Implementation Preferences, shows the variety of choices identified by the survey respondents and their preferred choice, a state wide revolving fund loan program. There are other options also identified, but reluctance by residents to increase their local tax burden apparently makes other alternatives less attractive.

Organizational responses to the following selected questions are presented in Appendix Exhibits - 1 through 5. These responses were grouped into four categories of responders: environmental organizations, federal, floodplain and special districts, and water organizations. Their responses provided additional comments and perspectives which were used by the project team to formulate the "The Stewardship of Stream Corridors" Program:

- Question 1- What does your organization feel is the most significant floodplain problem relating to stream corridors in Colorado?
- Question 2- What does your organization value about stream corridors?
- Question 3- What are the most significant barriers to achieving your organization's goals for stream corridors?
- Question 4-Does your organization believe Colorado has needs for multi-objective flood hazard mitigation or river rehabilitation projects that incorporate the following uses or benefits?
- Question 5-Does your organization know of problematic or threatened stream corridors that you feel would benefit from a multi-objective solution strategy?

Needs Identification Four major need categories have been identified based upon the findings

from the survey questionnaire: planning assistance, funding implementation, public information/technical assistance, and policy and criteria. Table 2 summarizes the community responses, identified needs, and recommendations for each of the need categories.

Planning Assistance. Stream corridor and local flooding is a significant problem for communities. Drainage plans need to be based upon a watershed drainage master plan which provides a broader perspective to planning than has been followed in the past. Planning efforts should include: flood plain delineation, master planning for selected basins, and project planning. Future stream and river rehabilitation projects should be built as multi-objective projects rather than single purpose projects.

The CWCB has recently undertaken multi-objective studies of the Arkansas, South Platte and Roaring Fork River watersheds in response to the 1995 flood events. Presently, there is no state program to deal with watershed planning needs on a pro-active basis. To date, watershed planning at the state level has been a re-active one.

Funding Implementation. In order to be effective, stream corridor and floodplain management focused programs need to have additional funding. A funding strategy should be formulated to provide financial assistance for watershed planning and a revolving loan fund for project implementation and construction. The mechanism for such a program would be grants for cost shared planning and loans for project implementation and/ or construction. A component of this effort would be to create a state wide revolving fund loan program to enable communities to address flood mitigation, stream rehabilitation, and watershed improvements. ✓

Public Information/Technical Assistance. Respondents identified nearly 500 miles of unmapped 100-year floodplain needing to be mapped. Statewide, CWCB staff and MWE project staff estimate there are at least 1500 miles needing to be studied and mapped. In addition, floodplain mapping completed nearly 20 years ago need to be updated. The community surveys also identified the need to (1) establish a program of information sharing to disseminate information relating to flood hazards, flood mitigation techniques, and stream corridor values, and (2) provide technical data, training, and education to local decision makers who deal directly with watershed, stream corridor, and floodplain management.

Policy and Criteria. Policies should be established concerning: (1) creating a storm water detention policy to control excess runoff from new development limiting the increase of peak flows in the floodplain, (2) establishing a statewide wetlands banking process to allow reallocation of existing and new wetlands resulting from multi-objective stream corridor management. New criteria should be established: (1) defining baseline conditions (100 yr.-event) for stream corridor management activities, (2) defining a higher level of protection (500 yr. event) than baseline conditions for critical facilities, and (3) creating and adopting a statewide model stormwater criteria manual.

Figure 1
Problems with Flooding or Drainage

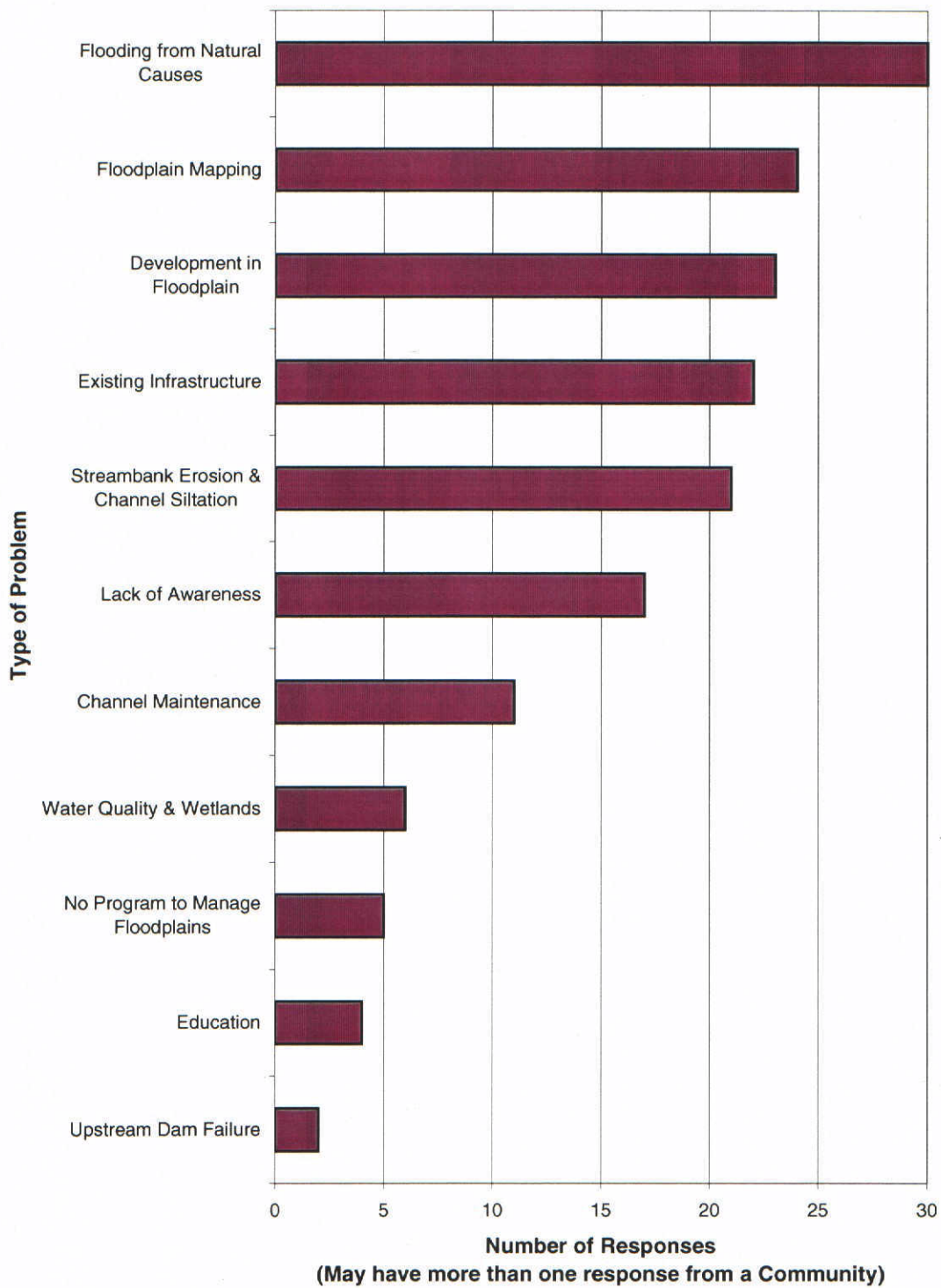


Figure 2
Values of Colorado Stream Corridors

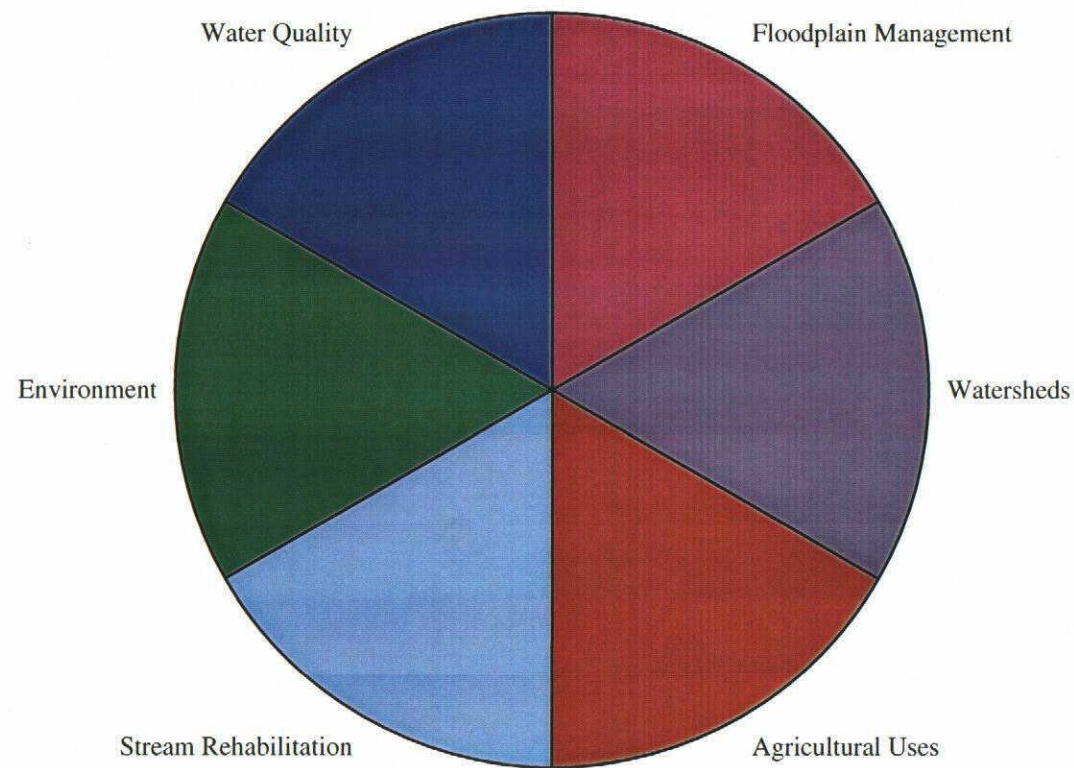
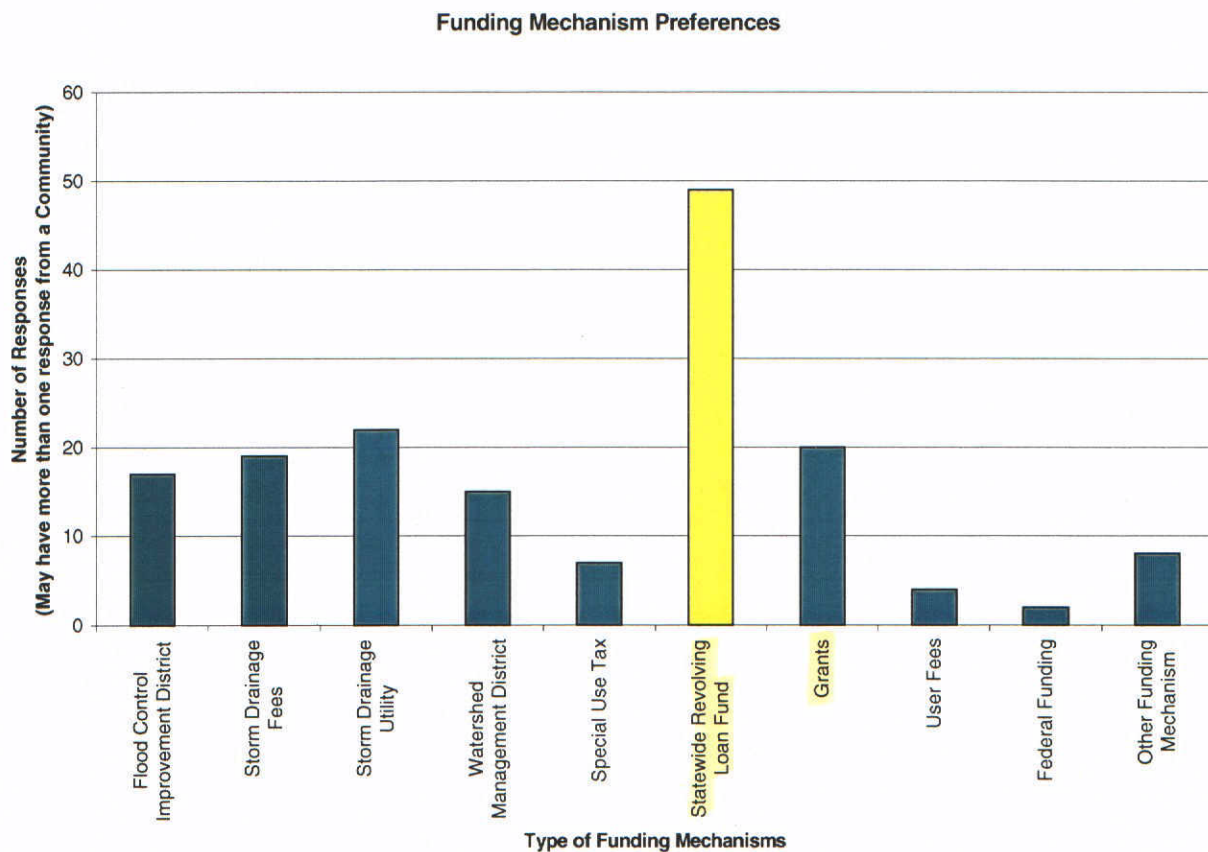


Figure 3
FUNDING IMPLEMENTATION

Need

- Lack of Funding
- Did Not Have A Funding Mechanism
- Desire Funding
- Planning Assistance for Planning and Implementing

Preferences



Note 1: 36% of respondents stated a lack of funding was the primary obstacle to planning and implementing improvements.

Note 2: 70% of respondents stated they did not have a funding mechanism or had an ineffective funding mechanism.

Note 3: Other preferences include Loans, No Tax-Based Funding, State Funding, Cost Share Program, Go Co Money, Capital Projects.

Table 2
TABULATION OF COMMUNITY RESPONSES, NEEDS AND RECOMMENDED SOLUTIONS
FOR COLORADO WATER CONSERVATION BOARD'S
STEWARDSHIP OF COLORADO STREAM CORRIDORS

COMMUNITY RESPONSES (134 current total received)	COMMUNITY/STAKEHOLDER NEEDS	RECOMMENDED STEWARDSHIP PROGRAMS
Planning Assistance Response - 62% of respondents expressed need for a multi-objective stream/river rehabilitation project. - 42% of respondents expressed need for watershed based Drainage Master Plan. - 88% of respondents cited one or more problems relating to stream corridor or local flooding.	Planning Assistance Need -Community growth patterns are adversely affecting natural stream corridor functions. - Specific, single purpose solutions are generally inadequate; need to apply multi-objective stewardship perspective to watershed and stream corridors. -Multi-objective planning solutions are needed for most Colorado watersheds. -Communities and landowners need assistance in formulating and planning their river or stream rehabilitation projects. -Floodplain management must be expanded to include: • stream rehabilitation/stabilization • habitat and riparian zone preservation/enhancement • flood hazard mitigation	Planning Assistance Recommendation -Facilitate local/regional multi-objective basin planning for Colorado's major river basins in cooperation with local stakeholders. -Establish a program to support local/regional river rehabilitation project planning for selected stream reaches. -Facilitate local planning for community based multi-objective flood hazard mitigation projects.
Funding Implementation Response - Local funds are unavailable or insufficient to support stream corridor projects - 36% of respondents felt lack of funding was the primary obstacle to planning and implementing improvements. - 70% of respondents said they do not have a funding mechanism or had an ineffective funding mechanism.	Funding Implementation Need -Funding programs at the local and state level. -Expanded opportunities for cost sharing in state and federal programs. -Effective program for administration of grants for planning and loans for project implementation and construction. - Need for flood related emergency response and post-flood land acquisition.	Funding Implementation Recommendation -Create a state wide revolving fund loan program to enable communities to address flood mitigation, watershed, and stream corridor management issues. - Expand the statutory language to allow CWCB to sponsor projects with federal agencies in addition to existing authority with the Corps of Engineers. -Establish a fund for post-flood property acquisition. - Support projects/planning that include diverse stakeholders in multipurpose projects to maximize opportunities and benefits to stream corridor and watershed projects.

Table 2, continued
**TABULATION OF COMMUNITY RESPONSES, NEEDS AND RECOMMENDED SOLUTIONS
 FOR COLORADO WATER CONSERVATION BOARD'S
 STEWARDSHIP OF COLORADO STREAM CORRIDORS**

COMMUNITY RESPONSES (134 current total received)	COMMUNITY/STAKEHOLDER NEEDS	RECOMMENDED STEWARDSHIP PROGRAMS
Public Information /Technical Assistance Response -Respondents indicate an immediate need for mapping 460 miles of unmapped 100-year floodplain. (statewide projection approximately 1500 miles) -20% of respondents believed floodplain maps need updating. -16% of respondents expressed need for technical assistance. - 64% of respondents expressed a need ranging from information to education.	Public Information/Technical Assistance Need -Community leaders need a better understanding of the basics of how stream corridors function to support decision making processes, investigations, and compliance investigations. -Mapping Needs: • Unmapped communities need to be mapped. • Out-of-date maps need to be updated in developing areas. -Community managers and stakeholders need technical information on stream rehabilitation and stabilization. -Landowners and buyer need the basic understanding of flood hazards within floodplains.	Public Information/Technical Assistance Recommendation -Establish an ongoing program for floodplain mapping. -Establish statewide GIS coverage for elements of floodplain management and stream rehabilitation. -Establish an annual notification process for the securing of flood insurance coverage and implementation of flood mitigation programs. -Create a task force of local, state, and federal agencies to establish priorities and criteria for floodplain mapping through pooling common sources of relevant data. -Share as much federal funds as possible by including multiple purpose functions of common interest to federal agencies.
Policy and Criteria Response - 78% of respondents do not have a Drainage Criteria Manual or other adopted Drainage Design Criteria. - 74% of respondents do not have a stormwater detention policy. - 54% of respondents expressed an interest in establishing a statewide criteria manual and stormwater detention policy. - General concern that regulating stream corridor development may conflict with private property rights.	Policy and Criteria Need Needs exist in the following areas: • Establish definitions for baseline conditions for stream corridor management activities (100 year event) and critical facilities (500 year event). • Detention of excess runoff from development. • Need to address wetland mitigation and habitat enhancement. • Need for a statewide model storm water criteria manual.	Policy and Criteria Recommendation -Establish definitions for baseline conditions for stream corridor management activities (100-year floodplain). -Establish definitions for critical facilities and appropriate level of protection higher than the baseline conditions (500 yr-floodplain). -Establish minimum criteria for detention of excess runoff from development. -Establish a statewide wetlands banking process. - Prepare a statewide model stormwater criteria manual.

APPENDIX
ORGANIZATIONAL RESPONSES
TO
SELECTED QUESTIONS

Exhibit 1

QUESTION 1: What does your organization feel is the most significant floodplain problem relating to stream corridors in Colorado?

Organization	Significant Floodplain Problems
ENVIRONMENTAL ORGANIZATIONS	
Boulder Creek Watershed Initiative	Maintaining ecological integrity while keeping floodplain areas a recreational resource for community.
CO Water Conservation Alliance	Housing on floodplains. They shouldn't be allowed.
Colorado Division of Wildlife - Puttman	Development in the floodplain and resulting impairment of water quality and riparian habitat.
Roaring Fork Environmental Education Association	Development adjacent or within floodplain - ie golf courses, housing, businesses, roads etc. - that add non-point source pollution and potentially decrease groundwater recharge.
Sierra Club, Rocky Mtn. Chapter - Cunningham	1) Damage to riparian vegetation; 2) Building in floodplains; 3) Hydrologic & channel modifications.
Valley Land Conservancy	Loss of riparian habitat and wetland habitat.
FEDERAL AGENCIES	
Environmental Protection Agency - Hamilton/Ruiter	Alteration of channels, floodplains and hydrology./Alteration of natural floodplain & flow regimes.
US Geological Survey - Lystrom	Land use activities, physical alterations, and vegetation encroachment that affect the hydrologic function of the channel and flood plain as a conveyor of a wide range of discharge.
USDA - Natural Resources Conservation Service	Management of the stream's riparian area vegetation along with controled development of housing and industry in floodplains.
USFWS	Human activities continue in floodplain. Quality and quantity of floodplain habitat continues to degrade.
FLOODPLAIN & SPECIAL DISTRICT	
Fountain Creek Watershed Project	In our watershed, the biggest problem is channel constriction and development and filling in of the floodplain. For the most part, the stream and its floodplain are not connected.
Grand Junction Drainage Dist.	Trash, debris, encroachment that prohibits removal of trash & debris.
Northwest Colorado COG	Local government allowance of building in floodplains; riparian; and wetland areas./Loss of riparian areas.
San Miguel Watershed Coalition	Urban encroachment on floodplain areas, loss of floodplain.
Upper Arkansas River Restoration Project	Arkansas Stream Corridor - historic deposition of very toxic mine tailings.
WATER ORGANIZATIONS	
Alamosa River Watershed Project	Lack of awareness of proper floodplain management. Poor management of riparian areas, channelization and other manipulations intended to "control" flooding have led to severe river instability.
Battlement Mesa WCD	Finding a reasonable balance between governmental control and desirable private development.
Colorado River WCD - Merritt/Tenney	Encroachment, resulting in loss of riparian habitat./development invasion
Upper Gunnison WCD	Don't know

Exhibit 2

QUESTION 2: What does your organization value about stream corridors?

Organization	Stream Corridor Value
ENVIRONMENTAL ORGANIZATIONS	
Boulder Creek Watershed Initiative	Their ability to attract various aspects of the community to environmental issues.
CO Water Conservation Alliance	Environmental benefits.
Colorado Division of Wildlife - Putman	Primary and irreplaceable wildlife habitat. Aquatic species obviously cannot exist without a healthy stream corridor.
Roaring Fork Environmental Education Association	Wildlife habitat, recreational opportunities, flood control capacity, groundwater recharge, etc.
Sierra Club, Rocky Mtn. Chapter - Cunningham	1) Wildlife habitat; 2) Esthetic enjoyment; 3) Maintain stream stability/minimize catastrophic flooding
Valley Land Conservancy	Extremely productive wildlife habitat, their value as migration corridors for many species, aesthetic qualities, recreational values.
FEDERAL AGENCIES	
Environmental Protection Agency - Hamilton/Ruiter	A full range of ecological function./Natural biodiversity & function.
US Geological Survey - Lystrom	The dynamic nature of the fluvial system to adjust to changes in streamflow and sediment supply.
USDA - Natural Resources Conservation Service	Stream corridors should be maintained in their original condition for fish and wildlife habitat, and also supply the background for protecting the quality of water and transport of the quantity of water during flood activities.
USFWS	Riparian vegetation, wildlife, birds, fish. The importance of the floodplain to the riparian and aquatic ecosystem integrity.
FLOODPLAIN & SPECIAL DISTRICT	
Fountain Creek Watershed Project	Flood attenuation, capabilities, wildlife habitat, aesthetic value..
Grand Junction Drainage Dist.	Vegetative diversity in a valley that annually receives only 8.5" of precipitation.
Northwest Colorado COG	water quality protection; ecosystem integrity; wildlife corridors; recreational usage; open space; flood protection/Aesthetics; Flood Control; Water Quality Protection; Streambank Stabilization.
San Miguel Watershed Coalition	The San Miguel has globally significant plant communities which we hope to help preserve.
Upper Arkansas River Restoration Project	Grazing; Fisheries; Riparian Habitat.
WATER ORGANIZATIONS	
Alamosa River Watershed Project	Wildlife habitat, forage production, streamside vegetation protects banks from eroding, water retention, aesthetics, wind break and shelter from the elements.
Battlement Mesa WCD	A source of water supply and transportation.
Colorado River WCD - Merritt/Tenney	Almost everything/water conveyance
Upper Gunnison WCD	Fisheries, recreation, irrigation diversions, land use opportunities, environmental values.

QUESTION 3: What are the most significant barriers to achieving your organization's goals for stream corridors?

Organization	Stream Corridor Goal Barriers
ENVIRONMENTAL ORGANIZATIONS	
Boulder Creek Watershed Initiative	Financial support to maintain community based monitoring network.
CO Water Conservation Alliance	We don't have any goals relating specifically to stream corridors.
Colorado Division of Wildlife - Puttman	All of the above.
Roaring Fork Environmental Education Association	We are primarily an educational organization - not advocacy or policy oriented. Time and money limit the depth of our work on specific projects such as stream protection. We do promote and teach watershed education.
Sierra Club, Rocky Mtn. Chapter - Cunningham	1) Managing proper use of riparian zones on public lands; 2) Use of legal/tech resources to combat improper 404 permits on private land; 3) CWA insufficiently powerful to deal with all stream/wetland disturbance problems
Valley Land Conservancy	Water mangement and flood control developments, potential hydropower developments, land use practices like instream gravel mining and extreem grazing of riparian areas that cause impacts to neighboring lands thru bank destabilization, channel changes.
FEDERAL AGENCIES	
Environmental Protection Agency - Hamilton/Ruiter	Ignorance leading to political opposition; Resistance to management concepts that are different from "the way we've always done it"; Sticking to old concepts like channelization, riprap, trapezoidal, over-designed channels./Political opposition to protection/restoration of natural systems.
US Geological Survey - Lystrom	Consistently securin funding for research, monitoring and analysis.
USDA - Natural Resources Conservation Service	education, cultural backgrounds, financial, political, environmental
USFWS	Political barriers are the most difficult to overcome. People refuse to stay out of the floodplain.
FLOODPLAIN & SPECIAL DISTRICT	
Fountain Creek Watershed Project	Political, technical, and financial. We must convince elected officials that watershed health is worthy of changing development codes and spending money. We also must devise cost-effective solutions to watershed instability.
Grand Junction Drainage Dist.	Political - USF&WS, Corps of Engineers
Northwest Colorado COG	Political/financial. A significant amount of private land exists along stream corridors within our planning region and many local governments are loathe to be perceived as infringing on private property rights and local funding is extremely limited/Significant land value pushing development closer to streams.
San Miguel Watershed Coalition	technical and financial
Upper Arkansas River Restoration Project	Political -- getting through the superfund mandates with negotiated process -- building trust, exeroizing good sense, meeting local landowner wishes & resolving legal liability requirements.
WATER ORGANIZATIONS	
Alamosa River Watershed Project	Political - getting all landowners to work together cooperatively to improve the health of the river corridor. Financial - funding erosion control work.
Battlement Mesa WCD	Environmental and legal restrictions.
Colorado River WCD - Merritt/Tenney	Establishing these goals are essentially a local land use issue which our organization does not get involved in./general acceptance of the nature of streams and rivers - they are dynamic
Upper Gunnison WCD	All of the above. [Underlined 'technical, financial, political, or others' in question.]

Exhibit 4

QUESTION 4: Does your organization believe Colorado has needs for multi-objective flood hazard mitigation, stream stabilization or river rehabilitation projects that incorporate the following uses or benefits?

[illegible]

Exhibit 5

QUESTION 5: Does your organization know of problematic or threatened stream corridors that you feel would benefit from a multi-objective solution strategy?

Organization	Threatened Description
ENVIRONMENTAL ORGANIZATIONS	
CO Water Conservation Alliance	Roaring Fork River
Colorado Division of Wildlife - Puttman	South Platte River from Denver downstream and from 11-mile reservoir upstream.
Roaring Fork Environmental Education Association	The Roaring Fork River corridor is experiencing rapid development pressure - ie. housing projects, roads, business development, etc.
Sierra Club, Rocky Mtn. Chapter - Cunningham	As one example - Douglas Creek, tributary to White River. There are numerous other examples in that area.
Valley Land Conservancy	Uncompahgre River - Through Ridgway, Montrose, Olathe-Ouray especially regarding channel restoration, wetland enhancement, habitat enhancement.
FEDERAL AGENCIES	
Environmental Protection Agency - Hamilton/Ruiter	Fountain Creek; South Platte River; Metro Tribs; Clear Creek.
US Geological Survey - Lystrom	Most of the larger streams and rivers downstream from retention structures or diversions have experienced changes related to attenuated flood peaks and altered sediment transport. These often are accompanied by vegetation changes.
USDA - Natural Resources Conservation Service	North Fork Gunnison, South Platte, Williams Creek, Alamosa Creek, Arkansas, Bear Creek, Black Squirrel, North Fork Republican, Wildcat Creek, Little Thompson, Fountain Creek. [Any stream corridors that are being encroached by development.]
USFWS	Colorado River from Rifle to state line. Gunnison River from Austin downstream to Grand Junction.
FLOODPLAIN & SPECIAL DISTRICT	
Fountain Creek Watershed Project	Fountain Creek/Monument Creek Corridor. The only thing that can save this system is to re-establish a stream corridor, complete with floodplains, remove channel constriction and devote the corridor to a greenway.
Northwest Colorado COG	All the previously mentioned areas under floodplain mapping needs./Eagle River, Roaring Fork, Tenmile Creek
Upper Arkansas River Restoration Project	The Upper Arkansas
WATER ORGANIZATIONS	
Alamosa River Watershed Project	The Alamosa River from the outlet of Terrace Reservoir to Hwy 285.
Boulder Creek Watershed Initiative	Areas downstream from power plant discharges.
Colorado River WCD - Merritt/Tenney	Many major streams, including Eagle, Roaring Fork./Roaring Fork River. Colorado River - Glenwood Springs to Loma.
Upper Gunnison WCD	Tomichi Creek, Ohio Creek, East/Slate Rivers in Upper Gunnison basin.