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Fountain Creek Restoration Projects Manitou Springs, Colorado

Master Plan



www.restorefountaincreek.org

Acknowledgements

Fountain Creek Restoration Committee
Pikes Peak Community Foundation
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Photographs courtesy of Steve Garufi and Pete Gallagher
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Very special thanks to the citizens that spent many, many hours in meetings and work sessions to arrive at the recommendations for this master plan.

Table of Contents

page

Mission and Vision Statements..... 4

Purpose..... 4

Introduction..... 4

Fountain Creek Restoration Committee (FCRC) 6

Fountain Creek Watershed Description 7

Upper Fountain Creek Today 9

 Sediment and Erosion

 Native Vegetation

 Sustainable Fishery

Related Projects 12

 Soda Springs Park Renovation

 CDOT Hwy 24 Midland Greenbelt Project

 Fountain Creek Watershed Plan

FCRC Work in Progress 14

FCRC Goals and Objectives 17

 Potential Partnerships and Funding Sources

Appendices 21

Bibliography 21



Mission Statement

To restore and revitalize the Fountain Creek ecosystem in Manitou Springs for wildlife habitat, fishing, and recreation.

Vision Statement

Fountain Creek in Manitou Springs will be a healthy riparian and aquatic habitat for wildlife, a sustainable fishery, and an aesthetically pleasing natural environment for viewing wildlife and other recreational uses.

Purpose

The Master Plan will discuss current habitat conditions, current and planned activities, and present our goals in support of the mission and vision statement.

Introduction

Starting at the foot of Pikes Peak, Fountain Creek is a mountain stream flowing year-round through Manitou Springs and four community parks. The creek provides a natural ecosystem within a highly urbanized area. A mountain stream of extraordinary beauty in each of the four seasons, many species of wildlife have depended on its aquatic and riparian habitat for their survival.

In addition, people have always valued Fountain Creek as one of the natural wonders of the area. The quiet rush of a mountain stream is soothing to the ear, and beautiful to the eye. In the heart of Manitou Springs along the south bank, a granite boulder bears an inscription marking the start of Ute Trail. A tribute to the deep meaning Fountain Creek has to local residents, past and present.



Fountain Creek is a valuable and precious natural resource. A sense of urgency exists due to habitat deterioration of the headwaters of Fountain Creek from nearby urbanization. Modifications to the surrounding landscape have altered natural ecosystems, in some cases permanently. Collaboration between public and private stakeholders will be critical to restoration projects, balancing urban pressures with the strong desire to enhance Fountain Creek.

A key issue in restoring local stretches of Fountain Creek is the need to ensure upstream conditions do not degrade restoration efforts. A long term goal is collaboration with government, business, and private citizens as stakeholders working together to preserve habitat restoration efforts all along Fountain Creek. With better water quality and management of the headwaters, Colorado Springs, Pueblo, and other Arkansas River communities will find their restoration efforts a little easier.

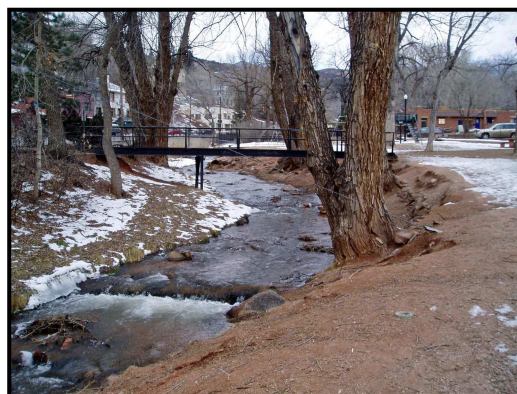
Fountain Creek Restoration Committee

The Fountain Creek Restoration Committee (FCRC) is a group of volunteers dedicated to goals that will lead to completion of a series of successful habitat enhancement projects. Under the guidance of several key individuals, meetings were first held in December of 2006 to discuss the potential of revitalizing Fountain Creek as it flows through Manitou Springs. Monthly scheduled meetings have been very effective, formulating goals and defining objectives. FCRC is now an official project of the Pikes Peak Community Foundation. They are coordinating FCRC efforts as a non-profit organization, and provide the support necessary as the projects grow in size and scope.

This Master Plan will present goals and objectives to all interested parties, becoming part of the design and execution of decision making processes. The plan will be a living document, to keep stakeholders up to date regarding specific activities in support of the overall goal of restoring Fountain Creek to a healthy and natural state. As FCRC habitat restoration projects are successfully completed at the local level, we hope to participate in development of a comprehensive approach that will include a regional master plan.

The Fountain Creek Task Force may be a valuable part of formulating a regional master plan. They focus on benefits to wildlife, recreation opportunities and tourism, with long-term sustainability, collaboration, and stable funding. To do this, establishing and maintaining a healthy ecosystem for Fountain Creek is absolutely critical.

FCRC has been coordinating its efforts with other organizations, governmental agencies, and elected officials. Several are noted in the plan, with brief summaries. Work with Senator Ken Salazar's office to make this effort part of the Fountain Creek Crown Jewel Project is particularly exciting. Senator Salazar's project has the goals of creating new recreational opportunities and restoring natural ecosystems and wildlife habitat along the entire Fountain Creek corridor.



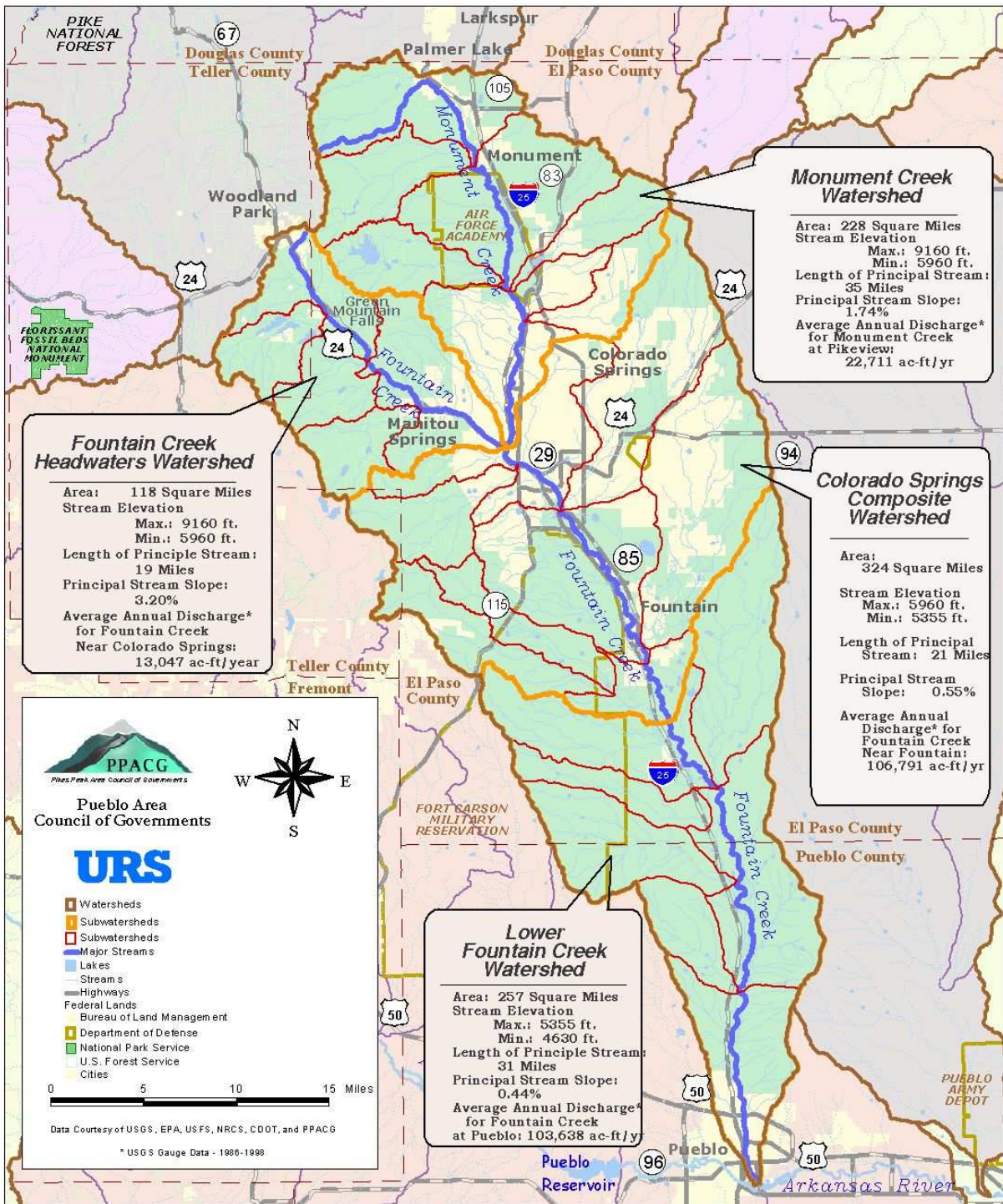
Fountain Creek Watershed Description

The entire Fountain creek watershed is bounded by Pikes Peak and Rampart Range to the west, Monument Hill and Palmer Divide to the north, Chico basin to the east, and the Arkansas River to the south. The total area from headwaters down to the confluence with the Arkansas River is approximately 930 sq. miles, and has elevation ranging from 9,200 to 4,600 feet.

A restoration of all the headwaters of Fountain Creek would encompass approximately 118 sq. miles, much of it contained in Pike National Forest and including parts of Teller, Douglas, and El Paso counties. Headwaters include 19 miles of streambed, and the municipalities of Woodland Park, Green Mountain Falls, and Cascade. Vegetation consists of mixed conifers, cottonwood, willows, and various grasses growing in poorly developed soils such as gravelly / sandy loams, with areas of exposed bedrock. These soils are highly susceptible to water and wind erosion. Average annual precipitation ranges between 11 and 17 inches.

The following picture illustrates major drainages of Fountain Creek. Fundamental relationships are evident, as what happens in the creek through Woodland Park is important to Manitou Springs, and what happens in Manitou Springs is important to Colorado Springs. The issues between Colorado Springs and Pueblo are a case in point of how important it is to find regional solutions to restoring and maintaining a healthy ecosystem for Fountain Creek. All parties in the various drainages of Fountain Creek must be brought into a collaborative effort.

Fountain Creek Watershed



/S068rtf1e2015/Projects/6742460.05_Fountain_Creek/ArView/Projects/Huc_framework.apr (LYA-Huc_framework) (March 7, 2001)

Upper Fountain Creek Today

As Colorado land areas urbanize and population increases, stream ecosystems can be substantially altered. Urbanization can cause changes in stream hydrology with negative effects on water quality, physical habitat, and water temperature. All these issues are known to have profound effects on riparian and aquatic communities of algae, plants, invertebrate life, and fish.

Sediment and Erosion

One of the effects of urbanization is a steady increase in the area of 'impervious' or barren surfaces within Fountain Creek Headwaters [1]. Rooftops, parking lots, and roads are the greatest contributors, with most pouring runoff directly to storm drains. Runoff from these sources will cause more erosion of poorly developed soils, higher suspended sediment concentrations, and increase the risk of periodic flooding.

Other interesting facts come from the PPACG/URS report, describing current loss of soil in headwaters of the Fountain Creek watershed, and the expected contribution to sedimentation problems further downstream. Urban development will cause an increase the amount of impervious area by over 10% in the coming decade [1]. In the near term, soil loss due to erosion will total 6 tons per year. Sedimentation levels due to this erosion are high, and expected to become even worse.

Flooding is more likely for three main reasons. The amount of water absorption is decreased, the creek has less capacity due to more sediment from erosion, and the meander of the creek across a floodplain is gone.

In the local area, there is a particularly extreme example of erosion and the sedimentation it causes. Pictured below is a mass waste dump adjacent to Highway 24 just below Rainbow Falls, upstream of Manitou Springs. Erosion is readily evident, and makes significant contribution to high levels of sedimentation in Fountain Creek through Manitou Springs.



A recent PPACG/URS report provides a summary of issues with the effects of urbanization on stream ecology.

“A stream’s shape evolves over time in response to the water and sediment loads that it receives; excessive runoff and sediment can cause significant changes in stream form. To handle increased flow caused by imperviousness, streams in urbanized areas tend to become deeper and straighter than wooded streams, and as they become clogged with eroded sediment, the ecologically important ‘pool and riffle’ pattern of the streambed is usually destroyed.” [2]

Sedimentation and erosion are primary concerns with the unhealthy condition of Fountain Creek as it flows through Soda Springs Park. At this time, there are pools filled with sediment and actively eroding banks. There are failed structures to manage the stability of stream flows and provide adequate aquatic habitat. These concerns and observations led directly to the first set of goals in the Master Plan.

Native Vegetation

A natural ecosystem will start with a stable, healthy environment for native vegetation. With good topsoil, and in the absence of erosion and heavy foot traffic, native plants will thrive. Very quickly, a wide variety of other native life forms will become part of a natural food chain.

Native plant communities will be enhanced, with human assistance, to restore areas of disturbance where invasive species may first appear. Recruitment of native species will be one of the goals of future restoration projects, using plants such as gray alder, blue gramma, canarygrass, sand dropseed, arrowleaf balsamroot, and brome. Below is a recommended list of native vegetation, for reference.

Alder (<i>Alnus tenuifolia</i>)	Aspen (<i>Populus tremuloides</i>)
Douglas Fir (<i>Pseudotsuga menziesii</i>)	Engelmann Spruce (<i>Picea engelmannii</i>)
Forb	Lodgepole Pine (<i>Pinus contorta latifolia</i>)
Rushes (<i>Eleocharis</i> , <i>Juncus</i>)	Subalpine Fir (<i>Abies lasiocarpa</i>)
Willow (<i>Salix amygdaloides</i>)	Grass (<i>Poaceae</i>)
Ponderosa Pine (<i>Pinus ponderosa</i>)	Sagebrush (<i>Artemisia</i>)
Sedge (<i>Carex</i>)	

Woody debris consisting of scattered logs and brush in the creek provide habitat for many different vertebrates and invertebrates, primarily birds and insects. A natural state of Fountain Creek will include woody debris along the banks and in the stream itself.

Woody riparian areas are threatened by loss of native species to non-native invasive plant life. The cycle starts with disturbed soils, due to urban development. These areas can support aggressive non-native plants, and are sources of erosion and sediment. As

erosion continues over the lifecycle of non-native species, they are distributed over a wider area.

Diffuse Knapwood is the predominant noxious weed along Fountain Creek and tributaries, with invasive plants such as Leafy Spurge, Chinese Clematis, Yellow Toadflax, and Spotted Knapweed also present [4]. Maintenance efforts to limit further distribution, and remove existing infestations will become more important with the growth of urban areas.

Sustainable Fishery

Native and non-native species of fish currently live in the Fountain Creek watershed. Sampling has shown small populations of brown trout in the Manitou Springs area. Erosion control and revegetation will reduce sediment, provide stable water quality, and increase the amount of cover, leading to better invertebrate food supply in support of a healthy fish population. Any stream restoration effort has a goal of increased fish population as a very important measure of success. Toward the top of the food chain, a sustainable fishery in Fountain Creek will represent a rehabilitated ecology, and provide the public with new wildlife viewing and fishing opportunities.

For the upper reaches of Fountain Creek, including Manitou Springs, cold water trout species such as brown, brook, and rainbow will thrive in improved aquatic habitat. Trout have provided local residents excellent fishing experiences in the past, and could be an important marketing tool for tourism in the local area. Stocking of these species by Colorado Department of Wildlife is possible, and plans are underway to start a restocking program.

Related Projects

Soda Springs Park Renovation


The city of Manitou Springs has held public hearings to gather public input regarding the renovation of Soda Springs Park, and provided funding of renovation projects for relocation of the children's playground, new artistic elements, new access points, and more robust natural surfaces. FCRC is working with the city to leverage their efforts, and collaborate with our initial Fountain Creek restoration project.

Fountain Creek Walk

The city of Manitou Springs has a plan and budget to start Phase 1 of the Creek Walk in Spring 2008, covering the area from the Fields Park to Shryver Park. Funding is available through the Transportation Improvement Project along with a City match. Phase 2 may be completed in 2009 from Beckers Lane to the east end of Manitou Springs. Funding for this phase is undetermined. Phase 3 is conceptual only at this time. There has been discussion of the City establishing a Creek Walk Task force at some point. FCRC will coordinate with this group or the city staff to obtain easements and collaborate on future construction work.




CDOT Highway 24 Midland Greenbelt [6]

In 2005, the Colorado Department of Transportation (CDOT) performed an Environmental Assessment (EA) study of a possible greenbelt project, implemented during upcoming improvements to Highway 24 between Manitou Springs and I-25. A creek walk has also been proposed, and may be a separate project. In the slide below, the EA study noted the condition of Fountain Creek beside sections of the existing roadbed.

Envision  West

Wildlife

- Large open space, park, and forest areas south of US 24 in El Paso County
- No CNHP habitat in study area
- Degraded condition of Fountain Creek limits habitat and wildlife values in project area



From their analysis, CDOT believes a comprehensive strategy to restore, maintain, and potentially improve conditions would be required. They may not have the resources necessary, and optimal decisions may not be made during greenbelt design to try and improve natural creek conditions.

CDOT strategy at this time is primarily focused on flood mitigation, and greatly increased capacity of a concrete channel located where Fountain Creek is today. Demonstration of local interest and FCRC habitat restoration projects may influence CDOT to give more consideration to the benefit of habitat restoration in the Fountain Creek watershed.

Fountain Creek Watershed Plan

The 2003 Fountain Creek Watershed Plan released by PPACG, addressed the need of local, state, and federal governments, with private property owners, to develop a more comprehensive understanding of the current condition and potential for improvement.

The Watershed Plan documents problems with erosion, sedimentation, flooding, and makes several recommendations for closer collaboration between very diverse interests, to permanently improve this valuable regional asset. FCRC is actively using the resources of PPACG and URS Group (under contract to Army Corps of Engineers) to better understand technical issues with planned improvements to Fountain Creek habitat through Manitou Springs.

FCRC Work in Progress

A demonstration project is underway for restoration of Fountain Creek riparian and aquatic habitat as it flows through Soda Springs Park. The restoration activities are based on the following assessment.

Aquatic Assessment and Habitat Enhancement Plan [7]

In February of 2007, the City of Manitou Springs granted a \$3,000 survey contract to FCRC. A survey of the stream channel, and aquatic and riparian habitat along Fountain Creek was performed by FIN-UP Habitat Consultants. The survey was completed in April of 2007, and submitted to FCRC. It included cost estimates for repair and restoration of a 700+ foot segment within the boundaries of Soda Springs Park. The renovation of Soda Spring Park by the City of Manitou Springs is viewed as an opportunity to demonstrate a habitat restoration project along Fountain Creek, and become a template for future projects along adjacent segments.



With urbanization comes the need to control the floodplain, typically with straight cement barriers on either side. With fewer curves (meander) that cover a larger area, the stream has a greater drop in elevation over a shorter distance, leading to higher flows. Several survey comments describe the current condition of Fountain Creek.

“...channels tend to be very unstable due to very high sediment supply available from both upslope and channel derived sources.”

“...exhibits generally poor quality aquatic habitat. Sedimentation from local erosion sources, as well as sources upstream, are negatively

impacting aquatic habitat within the reach [Soda Springs Park].”

“Stream bank stability outside of the segments confined by retaining walls was exceptionally poor...”

“Available cover appears to be a severely limiting factor to the health of the fishery...”



Based on survey results, a strategy for enhancement of the creek through Soda Springs Park will provide improved hydrology and habitat, environmental education opportunities, a self sustaining fishery, and greater esthetic value to the public.

1. Bank stabilization, top soil, re-vegetation, to create new riparian bench and stable floodplain.
2. Create nine hardened access paths to reduce erosion due to foot traffic.
3. In-channel habitat improvement such as deeper plunge pools, cross vanes, micro-vortex boulder clusters for deeper, self scouring pools, and more cover. By altering the shape of the streambed, there will be increased velocity variation and complexity, and less down-cutting effects of a straightened stream.
 - a. Rock formations reduce debris collection and help naturally flush sediment.
 - b. Restore four pools that have filled with sediment.
 - c. Optimize fish viewing opportunities.
4. Improve structural integrity of retaining walls in downstream stretch.
5. Install interpretive and etiquette signs (18"x24").
6. Removal of retaining wall from upstream stretch for added access, and increased flood plain area to slightly reduce risk of flooding. (see photograph below).



Upcoming Events

The FCRC Master Plan and Soda Springs Park demonstration project will be presented to the following groups:

- Chamber of Commerce – Dec. 2007
- Park and Recreation Board – Jan. 7, 2008
- Urban Renewal Authority – Jan. 2008
- Public Forum – Jan. 10th 2008 (tentative)
- Open Space Advisory Council – Jan. 28, 2008
- Manitou Springs City Council – March 2008
- Economic Development Council of Manitou Springs – 2008

FCRC Goals and Objectives

FCRC will use the Master Plan as a way of clearly communicating goals to individuals, businesses, and governmental agencies.

Mission Statement: To restore and revitalize the Fountain Creek ecosystem in Manitou Springs for wildlife habitat, fishing, and recreation.

Vision Statement: Fountain Creek in Manitou Springs will be a healthy riparian and aquatic habitat for wildlife, a sustainable fishery, and an aesthetically pleasing natural environment for viewing wildlife and other recreational uses.

We will work to address each goal in the following manner:

Goal 1

Develop a Fountain Creek Master Plan.

1.1 Perform riparian and aquatic assessments of all public and private reaches of Fountain Creek through Manitou Springs.

To be completed by December 2008.

1.2 Establish priorities for Fountain Creek construction projects.

To be completed by December 2008.

1.3 Monitor and mitigate upstream urban development activities, including development along US24 and the mass waste dump solution for Rainbow Falls.

Ongoing

1.4 Obtain in-stream easements in Fountain Creek where feasible.

To be completed by June 2008.

1.5 Coordinate the Fountain Creek restoration efforts with the City of Manitou Springs Creek Walk effort.

To be completed concurrently with the Creek Walk.

Goal 2

Communicate and collaborate with the community to ensure support and awareness of the Fountain Creek projects.

- 2.1 Develop and maintain a website at www.restorefountaincreek.org.

Completed July 2007, updated periodically.

- 2.2 Publicize Fountain Creek restoration projects to generate public enthusiasm and participation.

Ongoing

- 2.3 Coordinate with local schools for additional teaching and educational opportunities for students involved with riparian and aquatic habitat and stream hydrology.

Ongoing

- 2.4 Coordinate with Manitou Springs community groups to adopt and support Fountain Creek projects.

Ongoing

- 2.5 Obtain input and support from residents, private and public boards and commissions in Manitou Springs.

Ongoing

- 2.6 Coordinate with the Manitou Springs Economic Development Council to identify positive economic benefits to be derived from the riparian and aquatic enhancements of Fountain Creek.

Ongoing

- 2.7 Coordinate with the Manitou Springs Urban Renewal Authority to ensure that any urban renewal efforts enhance and support the Fountain Creek restoration projects.

Ongoing

- 2.8 Coordinate with the Fountain Creek Vision Task Force.

Ongoing

Goal 3

Secure sufficient financial support for construction of improvements to enhance riparian and aquatic habitat.

- 3.1 Arrange for organizational management by the Pikes Peak Community Foundation to operate as a 501(c)3 organization.

Completed March 2007.

- 3.2 Obtain \$3,000 from Conservation Trust Fund for Soda Springs Park riparian and aquatic assessment.

Completed January 2007.

- 3.3 Apply for a \$48,000 Division of Wildlife Fishing is Fun grant for the Soda Springs Park demonstration project.

Grant approved August 2007.

- 3.4 Raise \$12,000 for the DOW FIF grant match.

To be completed by December 2007.

- 3.5 Obtain \$2,700 from the Conservation Trust Fund for the aquatic assessment of the Shryver Park pond.

Completed September 2007.

- 3.6 Secure \$17,300 for the Arch to Arch riparian and aquatic assessment.

To be completed by June 2008.

- 3.7 Secure appropriate grants (DOW, GOCO, TU, State 319 Grants) and other funding to complete the construction projects identified in riparian and aquatic assessments.

To be completed by December 2010.

Goal 4

Coordinate construction projects to enhance riparian and aquatic habitat.

- 4.1 Coordinate the Soda Springs Park riparian and aquatic habitat demonstration project.
To be completed by Fall 2008.
- 4.2 Coordinate fish stocking of one contiguous mile of Fountain Creek.
To be completed by Fall 2008.
- 4.3 Design and build in-stream structures and other riparian and aquatic enhancements as required, to improve habitat from arch to arch in Manitou Springs. All improvements will require minimal resources for maintenance.
To be completed by December 2011.

Potential Partnerships and Funding Sources

The [Trust for Public Land](#), founded in 1972, helps conserve land for recreation and spiritual nourishment and to improve the health and quality of life of American communities.

The mission of [The Nature Conservancy](#) (TNC) is to preserve plants, animals and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive.

The [Palmer Foundation Land Trust](#) is a public, non-profit land trust composed of individuals, families, and businesses dedicated to the permanent protection of open space, agricultural, scenic, and natural lands in the Pikes Peak region.

[Colorado Open Lands](#) uses conservation real estate expertise, partnerships with the private and public sector, and fundraising capabilities to preserve land in 18 counties in Colorado.

The mission of the [Trails and Open Space Coalition](#) is to preserve open space and create an interconnected network of trails and greenways in the Pikes Peak region. It does this through advocacy, education, fundraising and volunteer programs

Appendices

TBD

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- [8] URS Group, Inc., *Fountain Creek Watershed Study, Soils Report*, prepared for US Army Corps of Eng, contract W912P-04-C-0006, task order number 002, January 2005