

FOREWORD

Dear Reader:

Coloradoans are especially blessed by the magnificent natural environments provided by our public lands, national forests, national parks, and wilderness areas throughout the State. Many of these areas are not readily accessible to all our residents; consequently, there is increasing recognition of the critical importance of having open spaces and natural areas "close to home." While we all treasure the opportunities to visit our national parks, we recognize that our earliest and most intimate childhood experiences with nature occurred someplace where we could walk or bicycle to — a local pond, a stream, or even an undeveloped field. Our state's recent growth and development and many of our technological advances increasingly separate us from the natural environment. This has led to a lack of understanding and appreciation for basic natural processes and in some cases what Robert Michael Pyle has identified as "The Extinction of Experience" (Pyle 1993).

The Trust for Public Land (TPL) led the development of the Cherry Creek Basin Open Space Conservation and Stewardship Plan to address these very issues – to identify priority conservation areas close to home and create a "Greenprint for Growth." TPL's greenprinting process is a land conservation strategy through which communities can protect quality of life, human health, and natural systems by creating an interrelated system of parks, trails, and open space. Creating this long-term vision allows development to proceed within the context of sustainability. In this spirit, the Cherry Creek project has been a collaborative process, working with local jurisdictions and other stakeholders in the Cherry Creek Basin to inventory and map the basic resources and to explore opportunities for interested jurisdictions to protect some of the natural amenities remaining in the Basin through various land conservation strategies and stewardship practices.

The future sustainability of the Cherry Creek Basin is in our hands. We hope that this plan will serve as a springboard for comprehensive and coordinated efforts to implement land conservation and stewardship practices necessary to ensure that the natural amenities we all now enjoy will also be available for future generations. We welcome your participation as we move forward to implement this plan, and as we work to realize the vision for the Cherry Creek Basin.

Regards,

Gene R. Reetz, Ph.D

Wetlands Team Leader

U.S. Environmental Protection Agency, Region 8

Therie Mackengie

Marie Mackenzie

Arapahoe County Commissioner

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Village, Town of Parker, and the Trust for Public Land.

This project owes a special thanks to the Cherry Creek Stewardship Partners, an organization developed in 1999 to bring together stakeholders in the Basin to promote effective stewardship of the Cherry Creek Watershed to ensure the resources of the Basin are taken into consideration as the Basin experiences rapid growth.

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Part 1 Introduction Why Cherry Creek?

he Cherry Creek Basin (Basin) is the dominant geographical feature of the Denver metropolitan area's southeast quadrant, linking the communities, towns,

and cities in Denver, Arapahoe and Douglas

Counties. Although it is within one of the nation's most rapidly developing areas, the Basin presents one of the most significant opportunities to conserve natural and agricultural lands, create community separators, protect and develop parks and trails, protect and improve water quality, restore degraded areas, and protect cultural and historic resources. Both the inherent natural resource value and recreational potential of the Basin are significant, as are the pressures of growth and development. This combination of natural values and recreational potential has created an opportunity to develop an integrated resource protection system to both complement and mitigate the effects of rapid development-a "Greenprint for Growth." This "Greenprint for Growth" will help define and prioritize preservation efforts in the Cherry Creek Basin.

Local governments in the southeast metro area are working diligently to manage rapid growth. The City and County of Denver will gain 1,335 acres of parks and open space by 2025 as part of the future Stapleton, Green Valley Ranch, and Lowry Redevelopment sites. Douglas County has created incentives to keep development in contiguous areas and discourage growth in open areas not yet served by community services. Arapahoe County has been successful in limiting development to one-third of its land base, keeping two-thirds in agricultural, park, and other open land uses. The Denver Regional Council of Governments (DRCOG) Metro Vision 2020 Plan identifies an "urban growth bounda," that seeks to prevent sprawl from further encroachment into the foothills and farther out onto the prairie and open spaces surrounding the Denver metro region.



Local government policies and practices directed at protecting open space have been enhanced by numerous open land acquisition and trail construction efforts. These resource conservation and recreational development efforts are significant; however, more initiatives are needed to ensure adequate protection of the distinctive features and habitat areas that make the Basin unique.

It revitalizes cities, guides growth, and protects water supplies and farmland.

Part 1 Introduction Overview

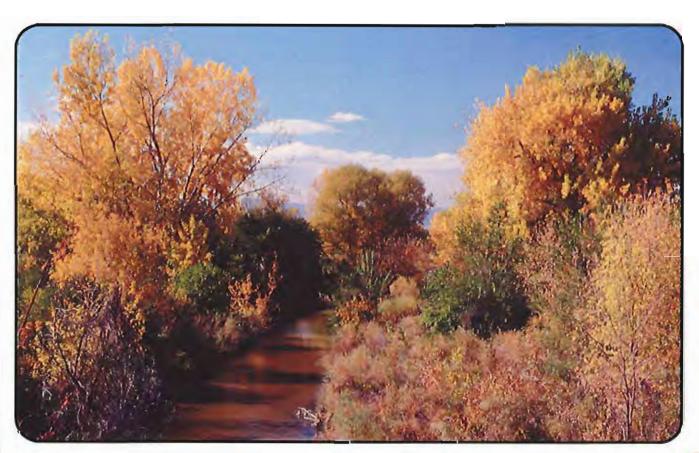


The purpose of this greenprinting effort is to establish a cross-jurisdictional relationship among the various local jurisdictions in the Cherry Creek Basin. Through this partnership, a plan has been developed to guide the creation of an inter-connected open space system aimed at protecting key riparian, upland, and aquatic zones. The following is a summary of the key actions that were undertaken to create the Cherry Creek Basin Open Space Conservation and Stewardship Plan:

- Create a vision for the future of parks and open space in the context of continued growth and development.
 This vision is dependent upon the multi-jurisdictional relationships and partnerships that have proven to be effective in the past.
- Develop recommendations for integrating stewardship and management policies of key stakeholders in the Basin. The goal is to achieve a consistent "look and feel" in the Basin, and ensure long-term sustainable management of its resources.

 Establish a framework to leverage limited resources of multiple partners into land conservation and stewardship projects with maximum effect.

This Plan is designed to serve as a strategic implementation tool for each jurisdiction to move specific projects forward. It is the culmination of numerous studies, public forums, and resource inventories. In addition, this project has prompted a greater understanding of the water quality of Cherry Creek and the relationship of land conservation to water quality. With the assistance of ERO Resources and Muller Engineering, this project is able to provide information to help local governments, state and federal resource agencies, and other stakeholders plan and implement effective resource protection measures in the Basin. This work also has helped distinguish which lands would be strong candidates for conservation based on their ability to have a positive water quality impact.





Part 1 Introduction Background

The Cherry Creek Basin Open Space Conservation and Stewardship Plan is the direct result of a Legacy Planning Grant by the Great Outdoors Colorado Trust Fund, in cooperation with the City and County of Denver, Arapahoe County, Douglas County and other municipal, agency and public partners. Over the course of 14 months, the Cherry Creek Basin Steering Committee met regularly to develop the information and guidelines in this Plan.

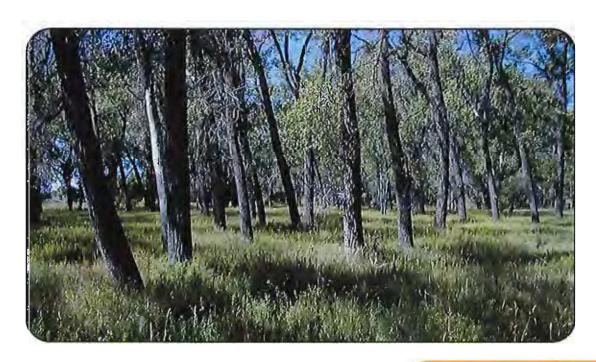
The key to implementation of any vision is cooperation and a sense of a common agenda. To that end, TPL worked to involve the communities in the Basin at every step in the process:

- Key citizens served on the Steering Committee, providing invaluable feedback to the public agency partners.
- In the spring of 2002, a series of open houses were held throughout the Basin.
- Presentations were given to multiple community and neighborhood groups.
- In the summer, one final open house was held at Cherry Creek State Park for all the public and private partners.

These discussions and interactions were critical to ensuring that the vision represented the various and diverse needs of all stakeholders.

One of the key organizations that will help carry this project forward is the Cherry Creek Stewardship Partners (the Partners). The Partners is an informal association of a broad range of stakeholders interested in promoting effective stewardship of the Cherry Creek watershed. As this vision moves forward, the Partners will continue to be an active facilitator of information between jurisdictions and the public.

TPL and the Partners also have teamed on a complementary effort within the Basin, entitled "Smart Growth for Clean Water," with a goal to promote the use of smart growth tools as strategies for protecting and improving water quality, and to provide the technical expertise at a national level on water quality issues impacted by rapid growth. The focus of the effort is to provide a model for how communities and developers can implement strategies for water quality enhancements and benefits. Land conservation is one of many smart growth strategies, and represents the common link between the Smart Growth for Clean Water project and the Cherry Creek Basin Open Space Conservation and Stewardship Plan. Copies of the Smart Growth report may be requested by calling the Cherry Creek Stewardship Partners at 303-291-7437.



Part 1 Introduction Status & Trends

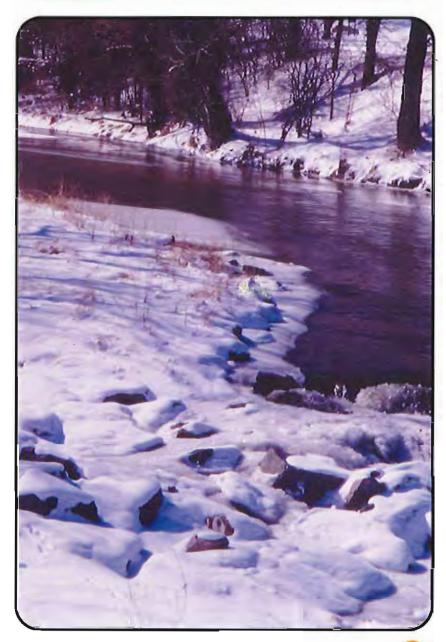


The health and sustainability of the Cherry Creek Basin is directly related to the various types of land use development. As rural land is converted to semi-urban and urban uses, the Basin experiences negative impacts on sensitive plant species, wildlife habitat, scenic views, and water quality. In more urbanized portions of the Basin, impacts from recreational users and stormwater runoff are significant issues.

The local governments in the Cherry Creek Basin have initiated efforts to protect land and provide recreational opportunities in the form of open space and parks. Generally, there is support at the county and municipal level for additional protection of parks and open space within the respective comprehensive and open space master plans.

All of the counties and municipalities in the watershed are experiencing tremendous growth pressures and recognize the need to balance this with additional parks and open space. However, there appears to be a disconnect between the magnitude of population growth and the quantity of parks and open space being conserved. This disconnect is a result of limited funding resources, inadequate planning, and surging population growth.

"Due to the rapid growth in the County and a physically active population, the demand for parks, trails and open space will likely exceed the ability of the County to serve as a sole provider. Therefore, existing and expanding partnerships will be even more important in the future" (Douglas County Parks, Trails and Open Space Master Plan 1998).





Part 1 Introduction Need for Open Space

FOR SPACE

ne method of assessing the need for parks and open space is to make a connection between population and the amount of existing parks and open space. While the amount of land that should be preserved as parks and open space depends in part on the availability of high quality natural resources, tying land to population is useful for comparative studies. If current growth trends continue to follow population projections in the Basin, the acres of parks and open space per capita will drop significantly. Although communities have made important strides in land conservation, significant additional efforts are needed. To assess the acres of parks and open space conserved in the Basin, a comparative analysis was performed to calculate the number of acres per 1,000 people in each county. Jurisdictions within the Basin were compared to other Front Range counties in Colorado (see Front Range Counties Parks and Open Space map at www.tpl.org/cherrycreek).

The amount of additional acres needed to maintain the current ratio of parks and open space per capita into 2020 is extraordinary (see Figure 1). It is highly improbable that communities such as Douglas County will be able to maintain its ratio of 1,120 acres per 1,000 people into 2020. The amount of land available for conservation and the magnitude of resources needed to conserve over 198,000 acres by 2020 is a monumental challenge. However, the aim of this analysis is not to quantify a future goal for open space acreage, but to demonstrate the disconnect between population growth and land conservation. While significant progress has been made, further efforts are needed. The average open space/population ratio along the Front Range is 413 acres per 1,000 people.

Figure 1. Current and future open space per population ratio

Communities	Acres per 1,000 people in the year 20001	Acres needed to maintain year 2000 ratio in the year 2020 ²	
Arapahoe County	30 acres	3,070 acres	
City and County of Denver	9 acres	792 acres	
Douglas County	1,120 acres	198,569 acres	
El Paso County	266 acres	47,965 acres	
Boulder County	740 acres	75,883 acres	
Jefferson County	313 acres	27,517 acres	
Front Range Average	413 acres	N/A	

¹ Open space and park data was used up to 2002 to calculate this ratio.
Population data was gathered from the Division of Local Affairs (DOLA) demography section.

² Population based on projections in the DOLA demography section.

Part 1 Introduction Economic Benefits of Parks & Open Space



In the context of land use planning and population growth, the economic benefits of parks and open space are often overlooked. Although the real estate market consistently demonstrates that houses close to parks and open space command a premium for this amenity, current land use patterns in the Cherry Creek Basin show little consideration for the financial benefit of parks and open space. Communities tend to be influenced by the perception that parks and open space represent a loss of tax revenue. The perception among many decision-makers is that development is the "highest and best use" of vacant land for increasing local government revenues.

A recent study by the National Recreation and Park Association (Crompton 2000) demonstrated that parks and open space overwhelmingly contribute to increased proximate property values. It also showed through cost of community services (COCS) studies that preserving open space is likely to be a less expensive alternative for communities than residential development.

Based on a number of past studies, Crompton concluded that the benefit of park and open space areas on nearby property values applies to both

urban and rural areas. Findings from the various studies also showed that the impact of a park on the value of property was influenced by the type of use and park design features. Parks serving primarily passive recreation were likely to produce a greater increase in proximate value than active recreation areas. Active recreation areas tended to have a greater level of noise and congestion. Although a

definitive number is not feasible, many of the studies indicated a "positive impact of 20 percent on property values abutting or fronting a passive park area" (Crompton 2000). This trend also is evident in residential developments adjacent to Cherry Creek State Park. Houses in developments close to Cherry Creek State Park are routinely sold for higher prices than houses farther away from the park. Furthermore, proximity to parks and open space is often used as a marketing tool.

Crompton also reviewed a number of past studies examining the cost of community services. These studies showed clearly that preserving open space can be a less

\$1.20 \$1.00 \$0.80 \$0.60 \$0.40 \$0.20 \$0.00 Farm/Forest/Open Space Residential

Source: Adapted from the American Farmland Trust, Farmland Infor-

mation Center, Technical Assistance Division, Northampton, MA.

Figure 2. Median cost to provide

public services to different land uses

expensive alternative to development. Although it is not a substitution for fiscal impact analyses, the COCS sparks a reassessment of the perception that development pays its own way. The American Farmland Trust completed a COCS study across 18 states to gauge the costs and revenues of community services associated with different land uses. A summary of the results is provided in Figure 2. For every \$1 in tax revenues these communities received from farm/forest/open space uses, the median amount the communities

had to expend was only 37¢ to provide public services. In contrast, for every \$1 received in revenues from residential developments, the median amount expended for community services was \$1.15. Thus, choosing residential development over open space is likely to exacerbate financial problems of communities.



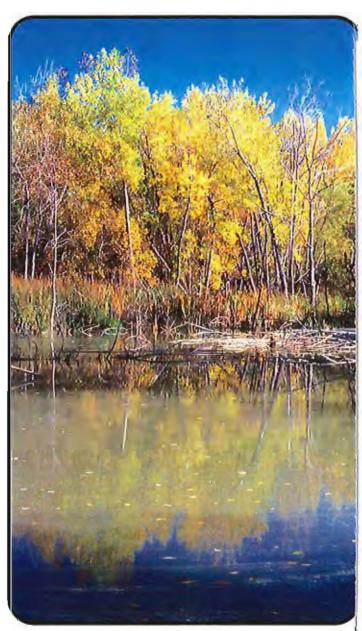
Part 1 Introduction The Vision & Approach

herry Creek serves as a critical conservation corridor that runs from south of Douglas County to the heart of downtown Denver. The Cherry Creek Basin Steering Committee's vision is of an interconnected system of open space and trails for the community and to sustain the health of the Basin and its native species. This vision is supported by ten goals:

- 1. Protect high-quality wildlife habitat and wildlife corridors.
- Foster multi-jurisdictional relationships among local governments, state and federal agencies, and local citizens.
- 3. Help mitigate development-induced water quality impacts.
- 4. Help meet open space and recreation needs of the region's growing population.
- 5. Protect important cultural and historic features.
- 6. Preserve the rural character and agrarian heritage of the area.
- Provide environmental education and interpretive opportunities.
- 8. Provide buffers to development and community separators.
- Provide recommendations on urban design to protect and appreciate Cherry Creek as a natural amenity.
- 10. Help establish trail connectivity between Cherry Creek and adjoining neighborhoods.

By protecting key open space parcels within the context of rapid development, the integrity of natural systems that affect our quality of life also will be protected. Development will proceed, but within a framework of sustainability, a "Greenprint for Growth." A recent study by the Solimar Group found that "larger-scale efforts – by government agencies and by large land conservancies – may be more forward-looking and strategic, but they tend to focus on resource value with little concern for the impact on metropolitan growth" (Hollis and Fulton 2002). The Cherry Creek Basin Open Space Conservation and Stewardship Plan is unique in this respect because it considers the interaction

of metropolitan growth and open space conservation. For instance, the Steering Committee created a vulnerability analysis, which identifies areas where potential future development overlaps with high resource values. This type of analysis assists in locating areas that have significant community buffer potential as well as the potential to protect valuable resources—thereby establishing priority areas for protection.



Part 2 Inventorying the Resources



The Cherry Creek Basin Open Space Conservation and Stewardship Plan provides background and tools to help protect the remaining resources of the Basin. During the greenprinting process, the Steering Committee recognized that although many of the communities in the Basin face similar issues, the City and County of Denver has unique opportunities and challenges due to its urban environment. These opportunities and challenges are also beginning to move southeast from Denver as the Basin's population continues to grow. To address the Basin as a whole and also focus on Denver's needs, a combination of Basin-wide maps and specific Denver maps were developed. Each of the following sections describes a map or series of maps

developed within a Geographical Information System (GIS). GIS is a computerized mapping and information database that serves as an atlas of existing data and as an analytical planning tool. Our first step was to collect information on existing resources by compiling a series of maps to serve as base layers described below. For purposes of this Plan, a study area was drawn outside of the Basin to illustrate various outside influences and potential regional connections. This study area is generally described from Castlewood Canyon State Park north to the confluence of Cherry Creek and the South Platte, east to Elbert County, and west to Interstate 25.

Vegetarian & Riparian Areas | & RIPARIAN AREAS

The Cherry Creek
Basin encompasses
a number of significant
and diverse vegetation
communities that were
once widespread along
the Front Range of
Colorado. Near
Castlewood Canyon State
Park, typical vegetation
includes dense thickets
of Gambel oak,
mountain mahogany,
ponderosa pine, and
grassy meadows of blue

grama, sideoats grama, and little bluestem. As the creek winds north, the vegetation transitions into mixed-grass prairie. These gentle hills and grasslands are characterized by short and mid-grasses, fringed sage, rabbitbrush, yucca, and noxious weeds such as leafy spurge, Canada thistle, and knapweed. In addition, cottonwood galleries and willows are present along sandbars and the perimeter of Cherry Creek



and other tributaries.
This pattern continues
into Denver where nonnative trees, such as
Siberian elm, line the
upper banks along with
native willows.

Wetland and riparian areas are used by wildlife more than other habitat types. Riparian areas make up only a small part of the total land area (less than 3 percent) in Colorado, yet

they support 40 percent of all the known plant species in the State and provide habitat for nearly 80 percent of the wildlife species that live in and migrate through Colorado (Kittel et al. 1999). The majority of wetlands occur along Cherry Creek and its tributaries and provide vital linkages between woodland and prairie habitat.



Part 2 Inventorying the Resources

Wildlife Habitat E H ABITAT

Cherry Creek and its tributaries are the backbone of wildlife habitat in the Basin. The Basin is home to herds of pronghorn, mule deer, white-tailed deer, and elk. It is also home to a number of threatened and endangered species, including Preble's meadow jumping mouse and the bald eagle. Prominent raptors in the Basin include the red-tailed hawk, northern harrier, Swainson's hawk, and the ferruginous hawk.

Water Resources 5 0 1 R C 5

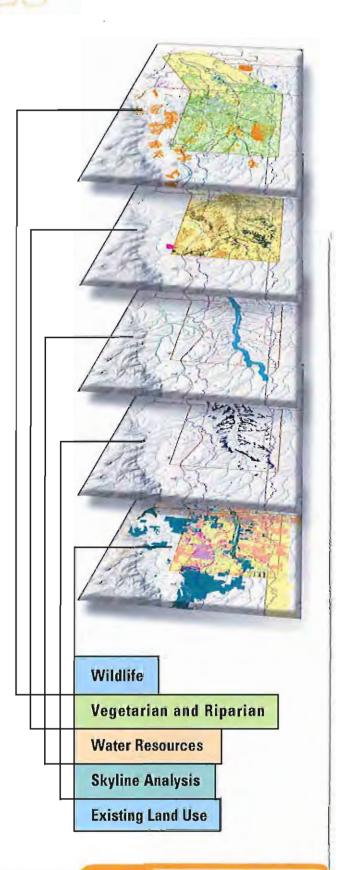
The water resources map shows information related to existing water resources in the Basin, including mainstream Cherry Creek and its major tributaries, subwatershed boundaries, 100-year floodplains, the alluvial recharge zone, wastewater treatment plant discharges, and major municipal wellfields.

Visual Resources - Skyline Analysis

Scenic views of Pikes Peak, Devil's Head, Mount Evans, and the ridgelines of Castlewood Canyon State Park create a priceless resource for residents and visitors in the Cherry Creek Basin. As one drives south from Denver, the lush vegetation of Cherry Creek gradually opens to expansive views of the bluffs near Parker and Castle Rock. Spacious drainages such as Bayou Gulch, McMurdo Gulch, and Russellville Gulch carve into the prairie, creating undulations along the grasslands. These scenic views help to engender a sense of community identity.

Existing (2000) Land Use

The existing land use map paints a broad picture of land use in 2000. Generally, Cherry Creek originates in a predominantly rural area interspersed with various semi-urban lots. As the creek flows north of the Pinery, urban land use increases up to Cherry Creek State Park. From the park to the confluence with the South Platte River, the Basin is almost entirely urban.



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Part 2 Inventorying the Resources Denver Natural Resources

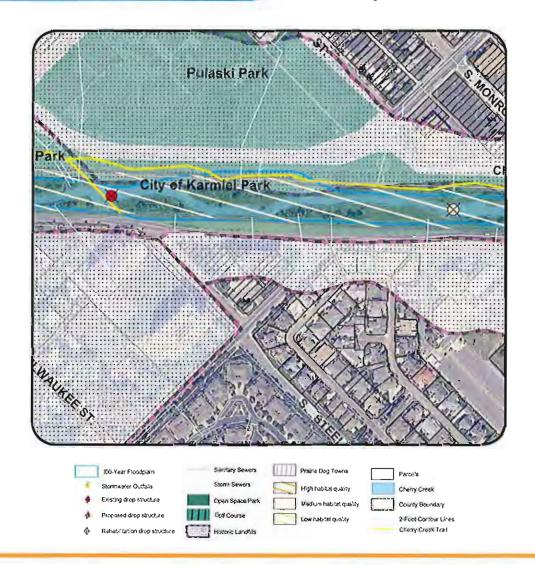


In the average city, 70% of the general public uses the parks system at least one day a year.

In Denver, that figure jumps to 91%.

Ron Vine, ETC/Leisure Vision, Olathe, Kansas

Cherry Creek supports a remarkable amenity for Denver as it progresses from a landscaped park greenway near the confluence with the South Platte River to a relatively natural riparian corridor. Visitors using the Cherry Creek trail may have the unique opportunity to see prairie dogs within Denver's boundaries, observe beaver dams, and view a variety of birds from raptors to warblers. Wildlife species present along Cherry Creek in Denver include beaver, muskrat, red-winged black birds, kingfishers, and red-tailed hawks. However, due to the intensity of recreational use, illegal dumping, disturbance, erosion from dam releases, and increased stormwater, a large portion of Denver's wildlife habitat is degraded and in need of restoration.





Part 2 Inventorying the Resources Water Resources & Quality

SOURCES

This Plan seeks to establish guidelines to protect water quality and natural resources in the Cherry Creek Basin. Understanding potential impacts to lakes and stream corridors and encouraging effective land conservation and stewardship practices to eliminate or mitigate the impacts are integral components in this Plan.

Healthy lakes and streams, together with riparian fringe and margin areas, comprise rich, diverse ecosystems that are critical to wildlife and people alike. For wildlife, these resources provide important forage and shelter. For people, the resources are for recreating, scenic value, growing crops, watering livestock, and supplying water to homes and businesses.

Healthy stream corridors also provide self-cleansing and self-healing functions. A healthy stream and riparian system acts like a natural "sponge" to cleanse water via intricate physical, biological, and chemical processes that occur in the wetland plant communities and soil substrates along watercourses. These processes filter out sediment and other particulate pollutants and can even immobilize dissolved nutrients (such as soluble phosphorus) and heavy metals (such as dissolved copper, lead, and zinc).

The natural shape and vegetation of stream corridors help to absorb the energy of floods during storm events. Natural waterways often have shallow channels with a bank height of a few feet and wide, relatively flat areas adjacent to the channel such as floodplain benches, or overbanks. These waterways tend to spread water during high flows and function to reduce the velocity and erosive power of floods. Overbank flooding reduces downstream flood peaks by temporarily holding back some of the floodwater. Overbank flooding also increases the amount of infiltration and recharge of aquifers. Rivers naturally adjust their form to maintain equilibrium conditions based on their supplies of water and sediment. Erosion scars that do occur can be mitigated through natural processes in a healthy system, such as the propagation of cottonwood groves in the fresh sand beds that can develop in river bends following a flood.

Resources and natural functions of lakes and streams are fragile. They can be disturbed by natural causes or the activities of people. Wildfires can devastate lakes and river systems by temporarily removing the protective mantle of vegetation, baking the ground so that it resists rainfall infiltration and becomes more erosive, increasing flood peaks and sediment loads, and eroding some stream reaches while clogging others with mud and debris. Other impacts to stream systems have been documented as a result of bison activity, widespread trapping of beaver, overgrazing of sheep and cattle, and timber harvesting activities.

Agricultural practices today continue to affect lakes and streams; however, the modern phenomenon of constructing



WATER

Part 2 Inventorying the Resources Water Resources & Quality



cities—with their densely arranged homes, places of business, driveways, sidewalks, roads, and parking lots—creates significant additional impacts that can degrade the health of our water resources. The chief cause of degradation is increased stormwater runoff generated by impervious surfaces, including roofs and pavement. Rainfall cannot penetrate these surfaces and infiltrate into the ground; therefore, it accumulates and flows downstream in greater volume and at greater velocities than before.

Increased runoff throws a natural stream's equilibrium out of balance, leading to degradation. Specifically, the increased runoff erodes and lowers the stream channel as the channel compensates for additional volume. This establishes a cycle of streambed and bank erosion and progressively deeper and wider channels. Vertical banks 10 to 20 feet high can be found along degrading streams in the Denver metropolitan area. Degradation rips out any vegetation that formerly existed along the channel and tends to lower the water table under the overbanks, drying up riparian vegetation and creating more of a dryland grass environment adjacent to the stream.

Stream degradation also concentrates flood flows. Storm runoff that formerly spread out several hundred or a thousand feet wide over the floodplain and flowed 2 to 4 feet deep, may run 10 feet deep and 30 feet wide in an entrenched channel. The velocity and erosive power of the concentrated flow may be two or three times greater than in a natural floodplain, further exacerbating degradation.

In an urbanizing environment, floods not only become more erosive, but occur more frequently. A flood that used to occur only once in 10 years may now occur several times each year due to the increased runoff from roofs, pavement, and other impervious surfaces.

Increased storm runoff from urbanization impacts water quality in two main ways:

- · Pollution associated with eroding stream sediments;
- · Increase in pollutant loads from watershed surfaces.

The quantity of sediment eroded from the beds and banks of degrading stream channels can be substantial; an inch of erosion in the bottom of the stream network upstream of Cherry Creek Reservoir could fill thousands of dump trucks. This sediment itself can cause problems—

impairing aquatic habitat, clogging channels and culverts, and filling reservoirs. In addition, many pollutants bind to sediment particles and are carried along with the sediments, only to be later released. In this way, sediment-bound pollutants (phosphorus and heavy-metals) can impair water quality. Phosphorus is of special concern in the Cherry Creek Basin because it has been identified as the critical nutrient leading to excessive algal growth in Cherry Creek Reservoir. Excessive algal growth in the reservoir, an impairment in itself, is also indicative of potential aquatic health problems such as a lack of dissolved oxygen in the bottom of the reservoir, something that can further release phosphorus and other pollutants from sediments and even lead to fish kills.

Urbanization and increased runoff can cause a corresponding increase in pollutant loads from watershed surfaces because there are more sources of pollution in an urban environment (e.g., fertilizers, petroleum products, and atmospheric fallout from vehicles and smokestacks), and there is more runoff to carry pollutants to downstream receiving waters. Urbanization tends to increase pollutant concentrations as well as the volume of runoff, creating increases in pollutant load over predevelopment conditions. This increase in pollutant loading can also have a short and long-term effect on recreation by increasing bacteria levels and altering water odor and color.

The following section describes a series of watershed maps that depict historic, existing and future scenarios for nutrient loading and stormwater runoff. This data can be used to prioritize restoration and stabilization opportunities before serious degradation occurs.





Part 2 Inventorying the Resources Water Resources & Quality

SOURCES



Predevelopment Runoff



Predevelopment Phosphorus



Existing Runolf



Existing Phosphorus



Future Runoff



Future Phosphorus

Estimated Storm Runoff (1963, 2000, and 2020)

These three maps depict estimated storm runoff in the watershed for three different time periods and development conditions. A comparison of the three maps shows how storm runoff volumes are progressively growing as urbanization moves southward in the watershed. Storm runoff estimates were based on a depiction of land use in the watershed for the years examined, hydrologic soils types, average effective precipitation (storms greater than 0.4 inch for undeveloped land uses and 0.1 inch for urbanized land uses), and runoff coefficients published by the Urban Drainage and Flood Control District (UDFCD 2001). The runoff estimates represent potential storm runoff that might be expected from the specified land uses on an average annual basis, but do not depict actual measured loads to the reservoir. The estimates do not reflect baseflows, alluvial flows, treatment plant discharges, or reductions in runoff from alluvial infiltration or pumping.

Estimated Total Phosphorous Loads from Storm Runoff (1963, 2000, 2020)

These maps depict estimated total phosphorus loads associated with storm runoff. Similar to the storm runoff maps, these figures apply to 1963, 2000, and 2020 development conditions. These figures illustrate how storm-related phosphorus is growing progressively greater as urbanization moves southward.

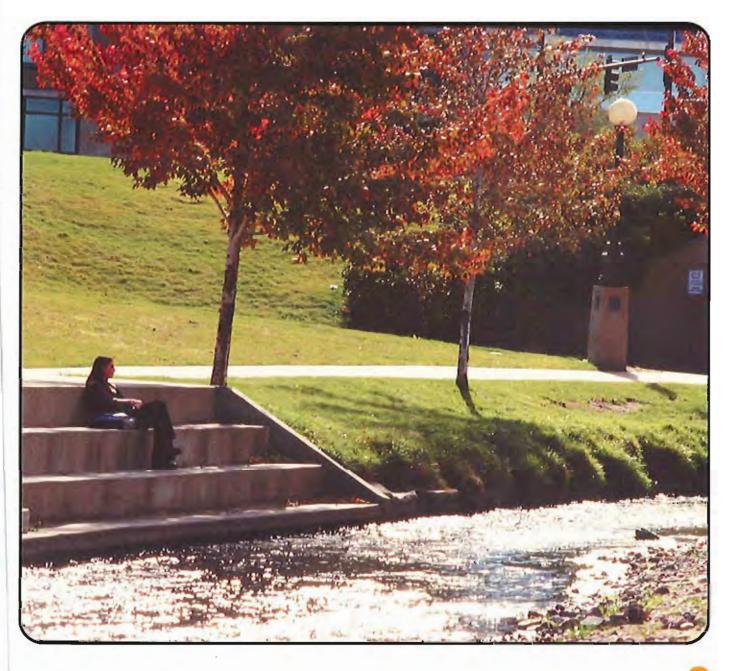
The total phosphorus loads shown are based on estimates of storm runoff for the three development conditions and represent total phosphorus concentrations of storm runoff from various land uses. Similar to the storm runoff maps, the total phosphorus estimates represent potential phosphorus loading that might be expected from the specified land uses on an average annual basis, but do not depict actual, measured loads to the reservoir.

The estimates do not reflect loads contributed by baseflows, alluvial flows, treatment plant discharges, or reductions in phosphorus from best management practices, natural or constructed treatment wetlands, or alluvial infiltration and pumping.

ASSE Part 3 Assessing the Opportunities



Dasin provides for the assessment of opportunities for land conservation and improving watershed health. Effective stewardship of the Basin's resources can only proceed by taking a comprehensive assessment of land use development, natural resources, and watershed health. Using the base maps and GIS technology, a resource composite (see page 16) was created to allow us to objectively examine a number of ways to identify the areas of greatest urgency to protect through land conservation and improved stewardship practices.



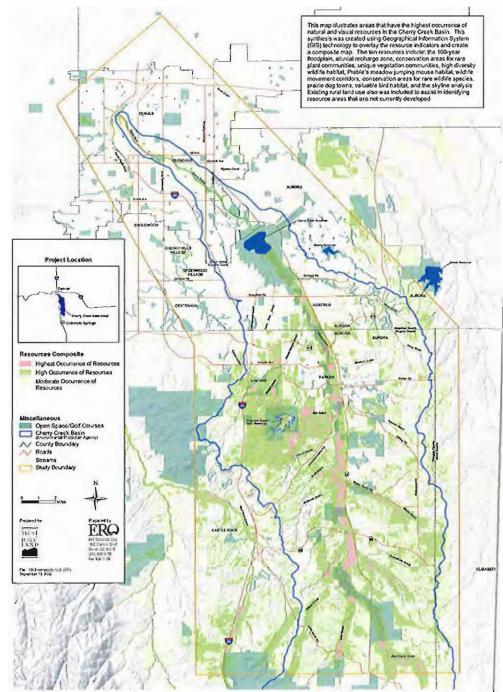


Part 3 Assessing the Opportunities Resource Composite

ESOURCE COMPOSITE

he resource composite map uses GIS technology to synthesize and compile data from the various maps collected in the Data Inventory. This map illustrates areas that have the highest occurrence of natural and visual resources in the Cherry Creek Basin. The resources include: the 100-year floodplain, alluvial recharge zone, conservation areas for rare plant communities, unique vegetation communities, high diversity wildlife habitat, Preble's meadow jumping mouse habitat, wildlife movement corridors, conservation areas for rare wildlife species, prairie dog towns, valuable bird habitat, and the skyline analysis. Existing rural land use also was included to assist in identifying resource areas such as farmland that are currently undeveloped.

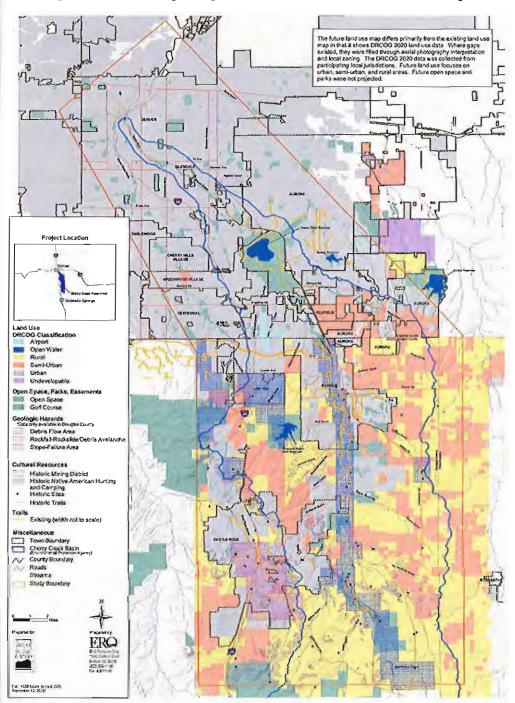
RESOURCE COMPOSITE Cherry Creek Basin Open Space Conservation and Stewardship Plan



Part 3 Assessing the Opportunities Future (2020) Land Use



FUTURE LAND USE Cherry Creek Basin Open Space Conservation and Stewardship Plan



expected build-out for the Cherry Creek Basin by 2020. Over 50 percent of the Basin within the study area will be urban or semi-urban by 2020. This equates to over 26,000 acres of existing rural land being converted to semi-urban or urban land use. As land use changes, effective stewardship of the land and water resources will become a vital component of sustaining watershed health.

The future land use map predominantly uses DRCOG 2020 land use data. Where gaps existed, they were filled through aerial photography interpretation and local zoning. The DRCOG 2020 data was collected directly from participating local jurisdictions and reflects the best available zoning data. Future land use focuses on urban, semiurban, and rural areas. Future open space and parks were not projected with the exception of the proposed Rueter-Hess Reservoir in Parker and areas zoned as open space within Lone Tree.

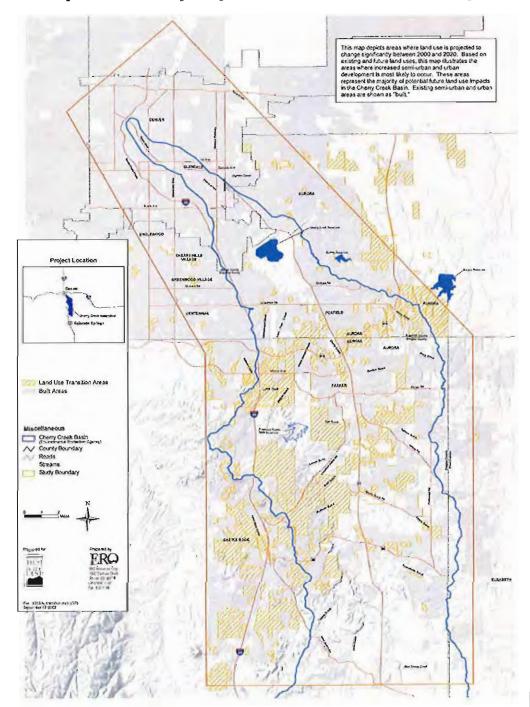


Part 3 Assessing the Opportunities Land Use Transition Areas

he land use transition area map depicts areas where land use is projected to change significantly between 2000 and 2020. Based on existing and future land uses, this map illustrates the areas where increased semi-urban and urban development is most likely to occur. These areas represent the majority of potential future land use impacts in the Cherry Creek Basin. Existing semi-urban and urban areas are shown as "built." This map represents a transition between the resource composite map and the vulnerability map.

LAND USE TRANSITION AREAS Cherry Creek Basin Open Space Conservation and Stewardship Plan

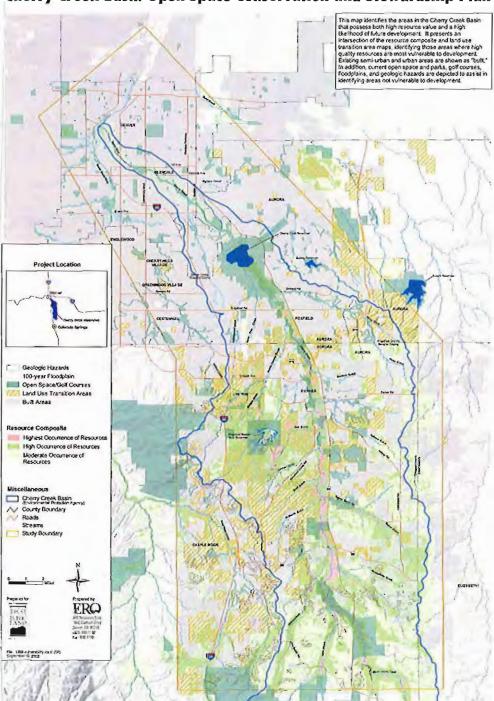
ON AREA!



Part 3 Assessing the Opportunities Vulnerability Map



VULNERABILITY MAP Cherry Creek Basin Open Space Conservation and Stewardship Plan



Inderstanding the interaction of land use and sensitive natural resources is critical to directing future conservation and restoration efforts. Funding for these efforts is limited; therefore, locating high priority areas is essential. The vulnerability map identifies the areas in the Cherry Creek Basin that possess both high resource value and a high likelihood of future development. It presents an intersection of the resource composite and land use transition area maps, identifying those areas where high quality resources are most vulnerable to development. The purpose of this map is to illustrate the inherent overlaps and interactions between natural resources and land use patterns. Existing semi-urban and urban areas are shown as "built." In addition, current open space and parks, golf courses, floodplains, and geologic hazards are depicted to assist in identifying areas not vulnerable to development.



Part 3 Assessing the Opportunities Subwatershed Vulnerability

As discussed in the section on water resources, recent and future population growth, increasing urbanization, and decreasing water quality all contribute

to a sense of urgency to protect watershed health and sustainability. By predicting future stormwater runoff and phosphorous loads, subwatersheds that will experience degradation in the future can be identified in the present. This process will allow conservation and stewardship efforts to be more proactive and effective.

The subwatershed vulnerability map

depicts the relative vulnerability of subwatersheds in the Cherry Creek Basin to impacts from urbanization. This map is derived from the results of the modeling effort

predicting stormwater runoff and total phosphorus loads in the Cherry Creek watershed for predevelopment (1963), existing development (2000) and future development (2020) conditions (also discussed in the Water Resources and Water Quality section). Subwatersheds were prioritized into the chart below based on their relative vulnerabilities.

Stabilization can be implemented through floodplain restoration, re-creating stream meanders, and bioengineering.

Category	Increase in Runoff from 1963 to 2000	Increase in Runoff from 2000 to 2020	Management Implications
1	Low	High	These subwatersheds are slated for future development. An opportunity exists to proactively stabilize these drainageways prior to significant degradation, reducing costs and preserving healthy stream systems.
2	High	High	These subwatersheds are developed and will continue to urbanize in the future. It is critical that these streams be stabilized quickly to reduce degradation impacts.
3	High	Low	These subwatersheds are urbanized. Many stabilization programs have already been undertaken in these areas, but it is important to follow these through to completion.
4	Low	Low	These subwatersheds are predominantly rural and are not expected to develop in the near future. It is important that other potential impacts, such as poor grazing practices, be inventoried and controlled. Urbanization beyond the limits shown for 2020 will likely affect some of these subwatersheds.

To further indicate priorities for restoration work in the subwatersheds, a priority index was developed and indicated using color shading on the map. The index represents the product of a subwatershed's estimated runoff load in 2020 and its percentage increase in runoff from 2000 to 2020, normalized to a scale of 0 (min) to 100 (max).

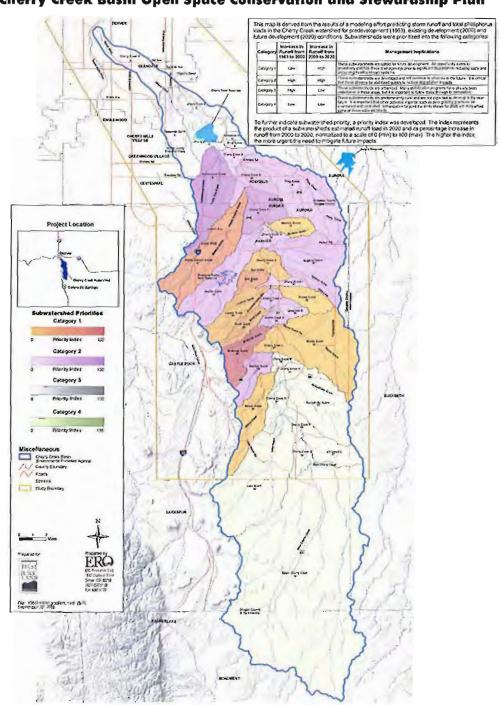
The higher the index, the more urgent the need to mitigate future impacts (depicted by the gradient color).

The subwatershed vulnerability map only depicts mainstem Cherry Creek and the largest of its tributaries. However, stabilization and restoration improvements will be necessary on all of the major drainageways (streams draining areas of approximately 100 to 130 acres) within and downstream of any urbanized areas.

Part 3 Assessing the Opportunities Subwatershed Vulnerability



SUBWATERSHED VULNERABILITY Cherry Creek Basin Open Space Conservation and Stewardship Plan





Part 4 Implementation

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eeting the goals of this Plan, to protect and enhance the health of the Cherry Creek Basin, will require ongoing collaboration from multiple parties. It also will take the combination of land conservation techniques and improving and integrating stewardship practices that have been discussed. To this end, the Steering Committee developed the set of tools presented throughout this document to identify and prioritize land conservation opportunities according to each jurisdiction's and community's needs. In addition,

the Steering Committee used many of those same tools to outline a number of stewardship recommendations that, if adopted, would improve how local communities, agencies, and citizens manage the resources of the Basin.

This also included two demonstration projects to illustrate how these recommendations could be implemented. What follows are the key implementation components for both land conservation and integrated stewardship practices.



Part 4 Implementation Land Conservation Strategies



Simply understanding the natural, cultural, historic, water quality and other resource values for the Basin provides an immense supply of information about where and why a parcel of land might be a strong candidate for conservation. Other considerations that have been mapped include a detailed understanding of water quality based on the impacts of development in the Basin, as well as the projected land use transition areas as shown in the vulnerability map. All of this is still, however, only part of the picture. Several other critical factors for land conservation have been addressed through this project:

1. Land ownership patterns. A conservation strategy in Denver, or even Arapahoe County, may look very different than that of Douglas County. At the southern end of the watershed there are still larger tracts of land in single ownership. In contrast, a key trail connector in Aurora and Arapahoe County may involve several landowners with relatively small acreage. One is no less important than the other, but through this project we worked to understand these patterns in order to be strategic.

2. Land protection criteria. Each city or county has different needs for acquiring and managing additional parks, trails and open space. Yet, there are common resource protection objectives that do apply to the entire Basin. In order to both allow for multiple priorities and still achieve consistent protection objectives, a Land Protection Criteria matrix has been created. Using this matrix, any local jurisdiction can assess where a parcel of land fits within the broad conservation objectives.

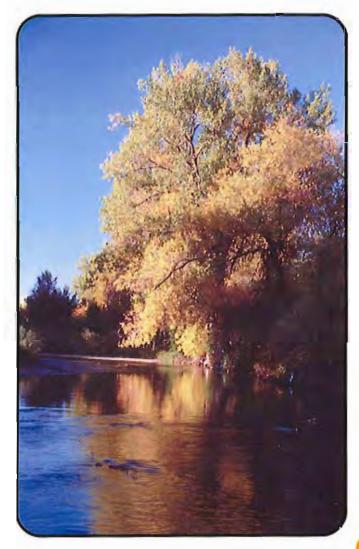
3. Unique funding opportunities. The key to success in the Cherry Creek Basin will be leveraging the limited resources of multiple partners to achieve a much greater benefit. To that end we have created a table of funding sources for both conservation and stewardship projects that can and should be pursued to augment local dollars.

4. Landowner cooperation. Any mention of a land conservation opportunity implies the landowner is a willing participant and willing seller. There are regulatory means for approaching conservation strategies, but the focus of this project is to provide the information and the tools to both communities and landowners to achieve a common goal. The first step in any land

conservation effort is understanding the desires and concerns of the landowner.

5. Land conservation tools. While full acquisition of a parcel of land may be most desirable for all parties, there are numerous far less expensive tools to achieve conservation. To help both jurisdictions and landowners understand these tools, we have provided brief descriptions of many possible alternatives available for the Cherry Creek Basin.

Detailed information for each of these components can be found at www.tpl.org/cherrycreek.

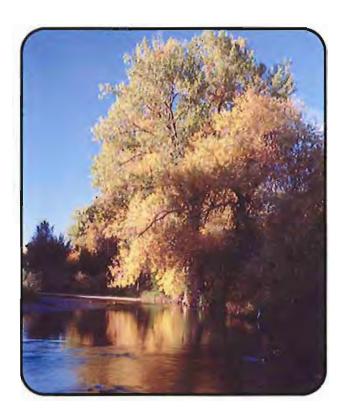




Part 4 Implementation Integrated Stewardship Practices

Within the Cherry Creek Basin are over 20 counties, towns, agencies, and state and local parks each having their own stewardship practices designed to protect natural resources and encourage public awareness and appreciation of these resources. In the context of crossjurisdictional management issues, there is an ongoing need to encourage these local stewardship efforts to work in concert with Basin-wide goals. Such efforts also help engender a sense of "identity" for the Basin, which further links local planning efforts with those of neighboring communities.

In an effort to better understand the Basin-wide similarities and differences between various stewardship practices related to parks, trails, and open space, ERO Resources conducted interviews with local planners, parks and trail supervisors, and public works personnel. Interview results revealed that there is considerable ongoing collaboration with respect to many stewardship practices in the Basin. For example, the Cherry Creek Trail Providers have collaborated with numerous Basin stakeholders to develop signage standards specific to the Cherry Creek corridor. In addition,



state parks personnel have been involved with sharing information regarding stewardship practices with neighboring counties and towns.

IP PRACTICE.

In other instances, some communities may not be familiar with stewardship practices that have proven to be effective in neighboring counties or state parks. For example, most counties, towns, and state parks had some degree of success in combating noxious weeds such as leafy spurge with mechanical and chemical controls; however, only a few of those surveyed used innovative biological controls such as goats, sheep, and various insects for weed control. While biological controls are not always a practical solution to mitigating noxious weeds, they have proven to be an effective management tool in the City of Denver's Natural Areas Program, Town of Parker, Douglas County, Cherry Creek State Park, and various Colorado Division of Wildlife (CDOW) properties.

Drawing from the interview data and various management and comprehensive plans, the Steering Committee and ERO generated a list of important stewardship categories where multi-jurisdictional collaboration and cooperation would benefit the Basin. These stewardship categories included:

- 1. Environmental/education and interpretation
- 2. Water resources and water quality
- 3. Recreational trails
- 4. Maintenance of open space and trails
- 5. Noxious weed control
- 6. Public use of parks and open space
- 7. Native flora and fauna
- 8. Signage
- 9. Urban design

For each stewardship category, the Steering Committee developed goals and recommendations that may be incorporated throughout the Cherry Creek Basin to ensure more consistent, integrated management practices. For a complete list of stewardship recommendations, go to www.tpl.org/cherrycreek.

Part 5 Next Steps



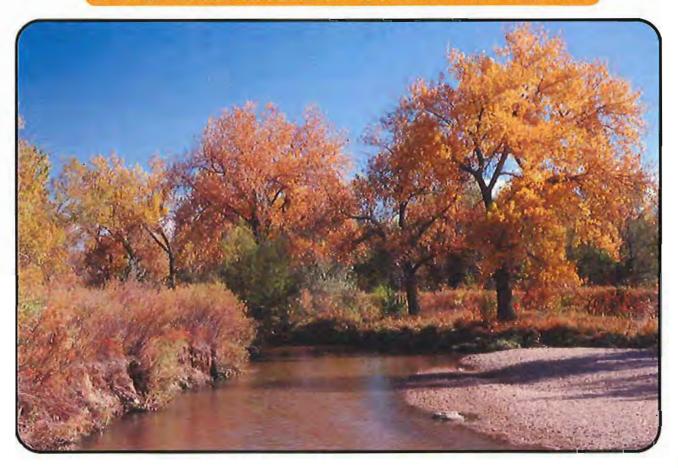
One of the major themes throughout this Plan is the collaborative approach to protecting and enhancing the Cherry Creek Basin. The two discrete yet complementary paths of land conservation and stewardship practices are critical to achieving the next steps outlined below. These steps will be ideally completed over the next 18 to 24 months.

Land Conservation

The Trust for Public Land is committed to assisting local jurisdictions to identify a number of specific land conservation opportunities within the Basin. Preserving land in the Basin is a powerful tool in achieving the vision of this Plan because it has the ability to protect wildlife corridors, unique vegetation communities, scenic views, water quality, enhance wildlife habitat, and increase recreational opportunities. Over the next 18 to 24 months The Trust for Public Land proposes to:

- Work with local communities and partners to prioritize land conservation opportunities. Using the land protection criteria, TPL and local communities will work to adapt the criteria to reflect specific priorities.
- Assist local communities in pursuing land conservation opportunities utilizing the tools outlined within Part 3 "Assessing the Opportunities."
- Pursue GOCO Legacy funding and additional funding sources for five to seven high priority projects.

To contact the Trust for Public Land Colorado Office call 303.837.1414





Part 5 Next Steps Stewardship Practices

while conserving open space is a crucial step toward protecting the Basin, it is equally important to consider sustainable, long-term stewardship practices. Using the Stewardship Practices outlined in section 4, the Steering Committee created a series of next steps which will work to promote continued cooperation as well as achieve specific improvements for the health and identity of the basin. Local citizens also will play a vital role in protecting the Basin and advocating stewardship of the land and water resources. Public involvement in new developments, new community parks, or new open space acquisitions will be necessary to carry this vision forward. Each of these next steps could be completed in the next 12 to 18 months.

- Publish the Cherry Creek Basin Newsletter
 Continue to inform and share information throughout the Basin.
- Develop a master environmental education plan
 Coordinate and enhance the existing education and outreach efforts of State Parks, Cherry Creek Basin Water Quality Authority, public schools, and the CDOW. There is potential to develop a curriculum utilizing GIS technology and the watershed context as a binding interpretive theme.
- Use Watchable Wildlife to create a formal wildlife viewing program
- Create a green developer program
 Recognize developers who demonstrate a stewardship ethic and establish guidelines for landowner incentives for innovative and voluntary stewardship practices.

 Incorporate recommendations from the Smart Growth for Clean Water project.
- Establish a bi-annual noxious weed cooperative
 Create a forum where ideas and information can be exchanged on a regular basis about noxious weed management. This cooperative would have excellent potential for collaborative grant proposals.

Implement mile markers and interpretive signage
 Encourage and expand current efforts by Cherry Creek
 Trail Providers and emphasize the importance of completing the trail. Maximize the opportunity to reach the public and highlight the recreational aspect of Cherry Creek.

SHIP PRACTIC

 Continue coordination and collaboration with the Cherry Creek Basin Water Quality Authority to implement water quality goals

The Basin Authority, under state mandate, is working to achieve a desired level of water quality for the Cherry Creek Reservoir. While the Basin Authority does not include the City and County of Denver, innovative and proactive guidelines developed in this Plan could be used to maintain and restore the overall health of the Cherry Creek Basin.

- Formal agreement with local governments, agencies, and citizens in the Basin on water quality and stewardship issues
 Consider Integrated Stewardship Practices as a starting point.
- Work with local jurisdictions to adopt and incorporate the recommendations outlined in the Integrated Stewardship Practices section
- Identify specific areas in need of restoration and implement revegetation plans and sustainable trail alignments with a focus on water quality

The Cherry Creek Stewardship Partners is a broad-based group with diverse interests within the Cherry Creek Basin. The Partners are engaged in an ongoing effort to continue the regional dialogue as the only group with representatives from both the upper and lower portions of the Basin. The Partners share information and pursue opportunities for coordination and integration of projects that affect the value and benefits of Cherry Creek. As such, the Partners will provide the forum for the cooperative effort required to accomplish the steps outlined above. To contact the Partners, call 303-291-7237.

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Related Plans, Studies & Documents

Town of Parker Master Plan: Adopted in October 2000, this plan provides guidance in both updating current plans and formulating future functional plans. This plan establishes recommendations on growth and development, land use, transportation, economic development, environmental quality, and community facilities.

Town of Parker Open Space Master Plan (2001): This plan analyzed the natural resources in Parker and developed goals and strategies to improve and expand the Town's open space system. Open space criteria and opportunity areas were identified to assist the Town in prioritizing their open space needs.

Douglas County Parks, Trails and Open Space Master Plan (1998): This plan provides a strategic framework for the development, and management of parks, trails, and conservation of open space in Douglas County. It also guides recreational and open space planning.

Douglas County Comprehensive Master Plan (2001): This document guides future growth and development decisions in Douglas County. It contains general policies about how and where growth and development should occur, while offering a broad yet realistic plan for the County.

Arapahoe County Comprehensive Plan (2001): This plan guides land use and development decisions. It also illustrates a generalized pattern of future land use, and it serves as a policy and strategy guide to update the County's land use regulations and establish the foundation for new programs.

Cherry Creek Corridor Vegetation Study (1999): This study documented vegetation conditions along the Cherry Creek Corridor within the City and County of Denver. It also prescribes management recommendations dealing with noxious weeds, public use, and wildlife habitat.

Cherry Creek Corridor Natural Area Resource Management Plan (2002): Although presently in draft form, this plan establishes a vision and general management direction for the 13-mile Cherry Creek Corridor stretching from the Cherry Creek Dam Spillway downstream to the confluence with the South Platte River. It also highlights proposed Natural Area classifications for the Cherry Creek Corridor; goals, objectives, and policies; and appropriate rules and regulations for preserving and enhancing the corridor.

Chatfield Basin Conservation Network (1998): This concept plan identifies seven key conservation corridors and six broad conservation areas in the Chatfield Basin that deserve special attention and a range of supportive educational activities.

Interstate 25 Conservation Corridor Plan (1995): This plan was developed by the Conservation Fund to identify critical lands for preservation, direct implementation efforts, and identify funding opportunities in the I-25 Conservation Corridor.

Denver Game Plan (2002): This plan projects a new vision and even new definitions of parks, open space, and recreation for 21st-century Denver. It is both a 50-year physical vision of Denver as a "City in a Park," with measurable steps to achieve that vision, and a mandate for new, more responsive City policies that address both social needs and financial realities.

Cherry Creek Corridor Master Plan (1999): This document outlines a number of alternatives for the greenway along Cherry Creek. These alternatives focus on transportation alignments but also consider parks and recreation and environmental features.

Glossary



alternative transportation — a method of moving oneself from point A to point B with means other than an automobile. Typical means of alternative transportation in the context of Cherry Creek include bicycles, skateboards, roller blades, etc. biological diversity or biodiversity — the variety of life in all its forms, levels, and combinations. Includes ecosystem diversity, species diversity, and genetic diversity.

brownfield – an area of land that if redeveloped, may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant.

buffer zone – an area of land that serves as a transition from a natural open space or park to a more developed area. It may include a landscape buffer or an area of water.

CCBWQA – Cherry Creek Basin Water Quality Authority. The Basin Authority was created by Colorado's legislature and operates under state law to undertake various water quality and capital projects and assess fees to support them, initiate and maintain water quality monitoring and controls, and recommend the types of controls implemented.

CDOW – Colorado Division of Wildlife. The Division of Wildlife manages the state's 960 wildlife species. It regulates hunting and fishing activities by issuing licenses and enforcing regulations. The division also manages more than 230 wildlife areas for public recreation, conducts research to improve wildlife management activities, provides technical assistance to private and other public landowners concerning wildlife and habitat management, and develops programs to protect and recover threatened and endangered species. Wildlife regulations are established by the eight-member Wildlife Commission. The agency maintains Regional Service Centers in Denver, Grand Junction and Colorado Springs, as well as Area Service Centers in 16 other cities and towns across the state.

channelization – forcing a stretch of river into a man-made course. It may entail removing bends from a meandering river o make it more navigable. On a smaller scale it may entail 'ditching" or straightening of a stream in order to divert water tway from agricultural fields. Regardless of the intent, the overall impact of channelization is likely to be negative. Channelization of streams and rivers typically results in

increased downstream sedimentation and increasingly severe downstream flooding.

community, plant or animal – an assemblage of populations living in the same area at the same time.

community separator – an area of land that acts as a buffer between two communities.

DRCOG – Denver Regional Council of Governments. The Denver Regional Council of Governments, or DRCOG (pronounced Dr. Cog) as they are known by their acronym, is a voluntary association of 51 county and municipal governments in the greater Denver, Colorado, area. Through the council of governments, local governments work together to address issues of regional concern. Those issues include growth and development, transportation, the environment, provision of services to the region's older population, and analysis of economic and development trends. Besides promoting regional cooperation and coordination among local governments, the council of governments resolves common problems, performs regional planning and provides services to its members.

ecological – of or pertaining to the interrelationships between plants, animals, man, and their environment.

ecosystem – the dynamic complex of plant, animal, fungal, and microorganism communities and their associated non-living environment interacting as an ecological unit.

encroachment – the placement of earth fill material or

structures within the floodplain of a watercourse.

Encroachment decreases flow area and tends to raise water surfaces and increase velocities of floodwaters.

exotic species – species that occur in a given place, area, or region as the result of direct or indirect, deliberate, or accidental introduction of the species by humans, and for which introduction has permitted the species to cross a natural barrier to dispersal; a plant or animal species that did

natural barrier to dispersal; a plant or animal species that d not occur in the this region or in the state prior to human settlement; not native; not indigenous.

treeboard requirements – freeboard refers to the amount of vertical clearance maintained above the elevation of a flood water surface to the lowest inhabitable floor, including basement, of a structure. Typically, the reference flood is the



Glossary

LOSSARY

noo-year event, or a flood of such a magnitude that it has a no percent chance of being equaled or exceeded in any given year. **geographic information system (GIS)** – An organized collection of computer hardware, software, geographic data, and personnel designed to efficiently capture, store, update, manipulate, analyze, and display all forms of geographically referenced information (data identified according to their locations).

GOCO – Great Outdoors Colorado. Formed in 1992 by the Colorado voters, GOCO receives 50% of the proceeds from the Colorado Lottery, its only source of funding, to fund projects that preserve, protect, and enhance Colorado's wildlife, parks, rivers, trails, and open spaces. The remainder of lottery proceeds is divided between the Conservation Trust Fund and Colorado State Parks. GOCO's funding is capped at \$35 million a year adjusted for inflation (\$46.5 million in Fiscal Year 2001/2002).

habitat – the place where an animal lives and is able to find the proper arrangement of food, water, shelter, and space. The place where a plant lives and is able to meet its basic requirements for growth.

interpretation – an educational activity in which meanings and relationships are revealed, and which create an understanding, appreciation, respect, and concern for the natural world through storytelling, hands-on experiences, and personal discoveries.

inventory – an evaluative process whereby the presence, absence, abundance, frequency, and/or densities of selected elements (e.g., plants, wildlife, and geologic features) within a particular area are determined. The presence or abundance of some species (not easily inventoried) may be inferred from the presence or abundance other elements.

kiosk – a stall set up in a public place where one can obtain information, e.g. tourist information.

mainstem – the major channel of a creek or stream.

mitigation – the practice and process by which the loss of some natural feature, population, community, or ecosystem is made less severe by its replacement. Mitigation can occur through restoration, creation, enhancement, exchange, or preservation.

native species — a plant or animal species that occurs, or used to occur, in the region or in the state prior to human settlement; a species that has not been introduced from somewhere else by humans; indigenous; not exotic.

noxious weed — legally, a noxious weed is any plant designated by a federal, state or county government as injurious to public health, agriculture, recreation, wildlife or property.

passive recreation — non-consumptive uses such as wildlife viewing, walking, biking, horseback riding, and kayaking.

pedestrian scale architecture — incorporating design elements that account for pedestrian users.

pollutant loading – The amount of a particular pollutant entering a body of water from storm water or other sources. Typically, pollutant loading is expressed in terms of pounds per unit of time, such as pounds per year. Pollutant loading is usually estimated as the product of a pollutant's concentration in water and the volume of water in a given unit of time.

Project WET – Project WET is a nonprofit water education program for educators and young people, grades K-12 run through the Colorado Division of Wildlife. The goal of Project WET is to facilitate and promote awareness, appreciation, knowledge, and stewardship of water resources through the development and dissemination of classroom-ready teaching aids and through the establishment of state and internationally sponsored Project WET programs.

Project WILD Aquatic – a program to assist learners of any age in developing awareness, knowledge, skills, and commitment to result in informed decisions, responsible behavior and constructive actions concerning wildlife and the environment upon which life depends. These programs are based on the premise that young people and their teachers have a vital interest in learning about the earth as home for people and wildlife. Wildlife is emphasized because of its intrinsic, ecological, and other values.

proximate – very near in location.

recreational facilities – restrooms, water fountains, and/or trailheads and information kiosks.

ride to work – a voluntary program promoting the use of bicycles to help relieve traffic, parking congestion, and reduce air pollution.

riparian – relating to, living in, or located on the bank of a natural watercourse (like a river) or sometimes of a lake; adjacent to water.

social trail – trails created by users that wander from formal, established trails.

stabilize – process to restore a degraded or entrenched drainageway that can be implemented through floodplain restoration, re-creating stream meanders, and bioengineering. storm water runoff – refers to the water flowing over land surfaces and in rivulets and streams after a rainstorm. Since storm water runoff represents excess water that does not get a chance to infiltrate into the ground, pavement and roof surfaces that come with urbanization tend to increase the peak

rate and total volume of runoff. Storm runoff, especially in urban areas, can pick up and convey a variety of pollutants, such as sediments, nutrients (phosphorus and nitrogen), petroleum products, salt, and various chemicals.

trail alignment – the specific location of a trail or footpath relative to its surroundings.

urban growth boundary — urban growth boundaries distinguish between land that is urban and that which is unimproved or rural. The urban growth boundaries define land that is planned by local governments to urbanize by the year 2020. The UGB does not mean that development is not planned to occur outside this land area, rather that the development within the UGB will be urban in character.

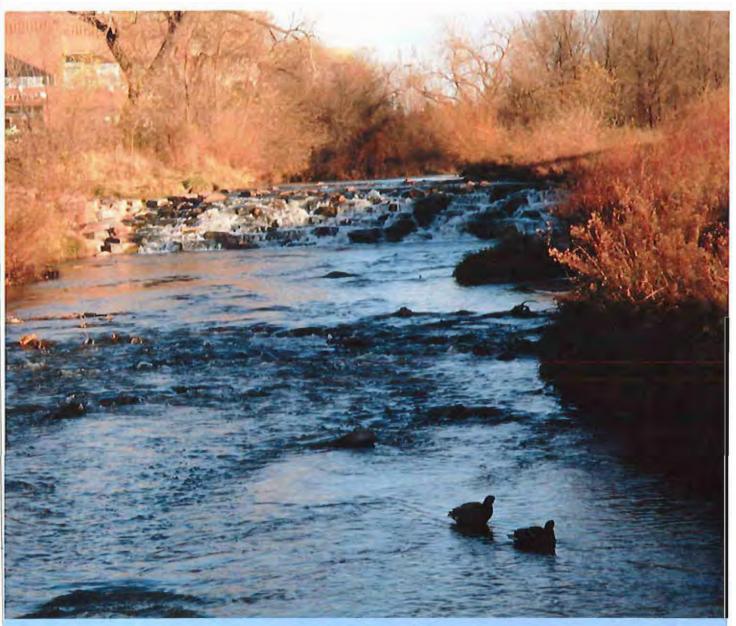


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